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The Massachusetts Medical Society

SECTION OF SURGERY

TUESDAY AFTERNOON, JUNE 11, 1929

THE Section of Surgery of the Massachusetts Medical Society convened in the Ballroom of the Copley-Plaza Hotel, Boston, Massachusetts, at two forty-five o'clock, Dr. Philemon E. Truesdale, of Fall River, the Chairman, presiding.

CHAIRMAN TRUESDALE: The meeting will please come to order.

In preparing the program for this afternoon, the purpose of the Secretary is very apparent. I feel that the subject which he has chosen is of common interest. Each angle is to be covered by a reader who will, beyond doubt, stress the practical viewpoint; from the standpoint of the number of readers, it has been made rather short so that there will be abundant opportunity for discussion.

In opening, the title of the first paper has been changed and Dr. Mason will read on "Medical Co-öperation in the Management of Surgical Cases." Dr. Mason!

MEDICAL CO-OPERATION IN THE MANAGEMENT OF THE SURGICAL CASE*

BY WILLIAM MASON, M.D.†

THE system of specialized practice which has gradually evolved during the past few decades has now reached a stage so pronounced as to impress even the lay mind seriously. So much has been written bearing both directly and indirectly upon the varied aspects of the subject, and so often is it assumed to imply a controversy between specialist and general practitioner, that one hesitates to mention it anew, much less to attempt the presentation of any original ideas in relation to it. It is true, however, that many of the problems of contemporary practice which are engrossing the attention of both profession and laity are the direct outgrowth of specialization; and only by a frequent discussion of these problems and the suggestions for their solution can the process of evolution toward an improved medical practice be hastened.

It must be conceded that specialization is but a natural consequence of the extraordinary increase in the total of medical knowledge. In turn, many of the contributions to medical science have been made possible by specialization. The methods now commonly employed in diagnosis, treatment, and pure research have become so complex or require such a high degree of technical skill for their performance that only by the larger experience gained from practice in a limited field can these methods be mastered. When special proficiency is obtained and is generally recognized, the field automatically becomes the more limited because of the increased demand for the particular service which the individual can render better. Each addition to the volume of material with which to work affords still greater opportunity for intensive study and productive research. Limitation of practice, therefore, can be credited as a true advance in securing improvement in diagnosis and treatment.

Too often, however, limitation of practice has been allowed to result in limitation of vision. Much of the criticism adverse to specialization as a whole has arisen through neglect to make this distinction. In his travels from specialist to specialist, a patient frequently accumulates an array of detached diagnoses, each carrying its especially indicated therapeutic implication, but the neglected fact that the patient is a human entity may contain the crux of the situation. Each diagnosis of itself may be correct and a possible explanation of even a majority of the symptoms; failure, however, to recognize the importance of even one concomitant symptom originating outside the field of the particular examiner may suffice to allow the basic disturbance to remain undiagnosed. Narrowness of

*Read before the Annual Meeting of the Massachusetts Medical Society, Section of Surgery, Boston, June 11, 1929.

†For record and address of author see "This Week's Issue," page 542.

perspective may thus nullify completely the advantages which should emanate from the superior attainment of the examiner in question.

Group practice, co-öperative practice, or any form of associated effort among individual specialists has arisen partly in recognition of this tendency in specialization. It has been assumed that a closely knit group can afford the advantages of a specialized study but with a better co-ördination of the results and an understanding of the patient's problem as a whole. Some individual of such a group must be responsible for the correlation of the separate data. The reports of the various examiners of necessity are made without the opportunity for a consideration of all the other aspects of the case. Such reports possess the virtue of being unbiased, but often they are subject to modification in the light of subsequent examinations. An illustration of this is found in the frequency with which even the correct interpretation of an x-ray film is dependent upon the clinical findings. Expressions of opinion without opportunity for reconsideration, therefore, can be even misleading if accepted for co-ördinating purposes. The success of the group theory in practice rests not only upon the opportunity for a correlation of data, but also upon the activity of the co-ördinator in securing by repeated conference individual opinions which will reflect an understanding of the case as a whole. The fulfillment of his function in the attainment of greater accuracy of diagnosis requires interpretation and evaluation as well as correlation.

Generally speaking, hospitals as organized at present offer their patients a similar type of co-öperative diagnosis and treatment, although the various units constituting the whole are likely to be less well co-ördinated than is the organized group. The patients are customarily segregated to physical units supervised by special services. Under such circumstances, the consultation is the medium through which an exchange of ideas in individual cases is secured. Unless obviously surgical, patients are commonly assigned to the medical wards for study and diagnosis. If the conclusion arrived at suggests a surgical therapy, a consultation is requested and an opinion rendered by a surgeon. Similarly, a member of the medical staff is called upon frequently to render an opinion relative to the general fitness for operation of a patient who has been admitted directly to the surgical ward; or, if surgery has already been performed, the patient may present some abnormal postoperative phase not immediately explained by the surgical procedure, whereupon a medical consultant is again called. In either case, the opinion is not the result of consecutive observation or complete study of the patient on the part of the consultant. At all other times, the separation of the services is complete. It is unusual to find the internist making a general visit on the surgical wards and rarely does the surgeon secure any extended contact with even those patients upon whom he may be called to operate, almost never with those on whom no surgical procedure is contemplated.

The segregation of patients, therefore, encourages the mutual isolation of the physician advising surgery and the physician who performs the operation. The perspective of the internist remains medical and that of the surgeon surgical. The medical opinion upon a patient assigned for an operation should not be the expression of a man with only slight conception of all the surgical problems involved, and the surgery should not be performed by a man with only slight conception of the general medical factors upon which the measure of success of the operation or even the life of the patient may depend.

That these are problems worthy of serious consideration has been emphasized by Cushing, who chose as the theme for his presidential address to the American College of Surgeons the statement of Lanfranc that "no one can be a good physician who has no idea of surgical operations, and a surgeon is nothing, if ignorant of medicine." Incidentally, he suggested the desirability of assigning a portion of medical cases to the surgical wards and vice versa. Likewise, Fitz has reiterated the necessity for the internist to acquire a surgical point of view and the surgeon a medical one.

In the case of the diabetic undergoing surgery, the dependence of the result upon a mutual understanding of the problems on the part of physician and surgeon has already been well recognized, so that to-day a true and continued co-öperation between these two is considered essential to the proper management of every case. The benefits of this intimate association are now being extended to thyroid patients, and these are being cared for more frequently by a special service with both medical and surgical representation. In other words, the segregation of certain types of patients is not along the same lines as in the past, but on a basis which recognizes the fact that the patient is not alone medical or surgical, but is rather an individual presenting a multiplicity of aspects, each exerting a profound influence upon the others. A further extension of this procedure throughout medicine and surgery more generally might well be encouraged.

The mere recognition of the inadequacies of the present situation does not, of itself, suffice for their correction. A medical point of view can be acquired only by contact with medical patients, and the attainment of a surgical understanding is not achieved by witnessing an operation occasionally. The system employed in our institution possesses certain features which appear to be worthy of description as bearing directly upon these problems, particularly in so far as they concern the surgical patients.

The staff includes the usual representation of

specialties, but the patients admitted upon the different services are not segregated; they are admitted to both wards and private rooms indiscriminately. For obvious reasons, pediatric and obstetrical patients constitute an exception to this procedure, although in times of unusual demand for accommodations, other patients may be admitted to the obstetrical floor. A contact with the patients on other services is therefore made easy for all members of the staff. Where segregation of patients is the practice, one seldom has this opportunity to observe the untoward changes occurring in patients outside his own sphere.

Nearly all patients admitted to the hospital, whether medical or surgical, are seen first by one of the resident physicians who takes the history, makes a physical examination, records his preliminary impression as to diagnosis, and orders the indicated x-ray and laboratory examinations. The patient is next seen by a member of the visiting medical staff, who checks the history and physical examination and records his answer to the following four questions:

1.) Diagnosis?
2.) Do you advise medical or surgical treatment?
3.) If surgical, do complications exist which add to the surgical risk?
4.) Suggestions for further examination or preliminary treatment?

Likewise, the surgeon records his opinion on cases presumably medical, but where there is any suggestion of a disease which ordinarily would require surgical intervention. Final answer to these questions disposes of the case and epitomizes the knowledge which should be required concerning any patient who is to undergo an operation.

This routine preoperative medical examination of surgical patients often has prevented the performance of ill-advised surgery. Leukemia underlying extensive suppurative necrosis of the jaw; hemorrhagic disease as a cause of epistaxis or menorrhagia; angina pectoris or failing heart and passive congestion of the liver with pain suggesting a gall-bladder origin; and pulmonary tuberculosis, pneumonia, or tabes dorsalis producing abdominal symptoms—these are but examples where the timely recognition of the primary disease has spared the patient an unnecessary operation. The ultimate decision as to the type of therapy to be applied, however, must remain with the physician to whom the patient has been referred. The transfer of the patient to another service only partially disposes of his medical responsibility, for the internist continues his observation until the patient is either discharged or returned to his care.

In so far as time permits, the patients are accompanied to the operating room by the internist. Frequently his opinion is sought during the operation upon the condition of the patient and the measure of endurance remaining, whenever the scope of the operation is to be increased. He is often called upon to play an actual part in the proceedings, for he is available to pass a stomach tube or administer intravenous or subpectoral saline solution, should the occasion require. The spirit is fostered constantly that no service is too minor for any member of the staff to perform, if he is the most readily available and if the service will bring about improvement in the patient's condition or add to his comfort. Moreover, by actual participation in the prevention or treatment of the adverse changes which may arise in the patient's general condition during the surgical procedure, the internist is gaining a more lasting impression of them.

Even more important, however, is the rôle of the internist in the after-care of the surgical patients, for it is he who makes the afternoon visit upon all patients in the hospital. This feature of our organization appears to work out exceedingly well. It is here that the internist broadens greatly his surgical point of view, for he is not only continuing his observation of surgical patients, but is also assuming a share in the responsibility of their management. He confirms or modifies the routine post-operative orders in the individual cases, and prescribes special treatment for any unusual manifestations which the patients may present. The frequency with which he meets the indications for gastric lavage at this interval following the operation, makes him less reluctant to pass the stomach tube than even the surgeon himself. One who has seen the development and observed the manifestations of post-operative nausea and vomiting, gastric dilatation, intestinal paresis, organic obstruction, embolus, pulmonary collapse, desiccation, acidosis, phlebitis, pyelitis, etc., and followed their response to the treatment which he himself has prescribed or performed, cannot help but gain an appreciation of the hazards of surgery. He cannot fail to be impressed by the occurrence of cardiac or pulmonary complications when preoperative examination had not revealed their likelihood; or by their failure to occur when he had confidently predicted them in his preoperative opinion. The larger his experience along these lines, the more dependable is his preoperative estimation of the risk and the more careful his attention to detail in the preoperative preparation of those patients whose general condition makes dubious a successful outcome of imperative surgery. In addition, the surgeon feels confident that the later development of any medical complication will be recognized more promptly.

The experience at our hospital gives every indication that these conclusions are more than theoretical. The surgical staff freely admits that where difference of opinion exists as to the advisability of operative interference, only the strongest of motives will permit them to act

contrary to the medical opinion. It should not be inferred, however, that the internist is always a deterrent to operation, for many times he becomes a force impelling a reluctant surgeon to operate. In this type of case, the findings or subsequent course has been, according to the surgeons, such as to strengthen their confidence in the judgment of the medical staff upon surgical questions.

Finally, an important, although often neglected consideration in any system of co-öperative management is found in the relation which the patient's family physician bears to it. In the larger hospitals, particularly, it is rare to find the family physician following the progress of his patient intimately. The exigencies of general practice or simple inertia may in large measure be responsible for this, but not infrequently the attitude of the hospital and staff in no way encourages, and often distinctly discourages, any feeling on the part of the physician that his co-öperation and interest are desirable. Whether the fault lies with the hospital or with the physician, such lack of co-öperation is, nevertheless, another factor fostering a limitation of vision detrimental to medical practice, and so to the patient. Responsibility for a timely resort to surgery and for the care of the patient after its performance rests upon the family physician. He cannot be expected to develop a proper conception of the indications for surgery or an understanding of the problems and complications of late convalescence, if the period of hospitalization always constitutes a hiatus in his contact with patients. We have noted definitely that fewer surgical patients are received too late for operation from those physicians whose practice it is to follow the progress of their patients while they are in the hospital. Without relinquishing our own responsibility, we therefore endeavor to enlist the real co-öperation of the patient's physician, and welcome from him any suggestions to be weighed with the other general evidence in formulating our judgment in a situation.

In the preceding discussion, the position of the internist in the general supervision of all patients in the hospital has been emphasized, and more especially his relation to the postoperative treatment as well as preoperative examination of all surgical patients. It should not be inferred, however, that we fail to appreciate the fact that the care of patients after operation is essentially a surgical problem. While there are many complications which definitely are more medical than surgical, nevertheless, the surgeon himself must retain complete direction and control of the after-care of the patient.

In conclusion, some of the features of the system described may not be entirely practical for the larger institution. Nevertheless, an intimate relation between medical and surgical services should elevate the standards of practice in any hospital. The widest expansion of vision, moreover, can come about only through a relationship which involves real responsibility. Any system which interlaces the activities of internists and surgeons should result in greater accuracy of diagnosis and far better treatment of all cases, especially those which are surgical.

CHAIRMAN TRUESDALE: The next paper is "The Choice of Anesthesia," by Dr. Lincoln F. Sise and Dr. Philip D. Woodbridge.

CHOICE OF ANESTHESIA*

BY L. F. SISE, M.D.,† AND P. D. WOODBRIDGE, M.D.†

IN considering the choice of anesthesia, the scope of this paper will be limited to the operations of general surgery, without venturing on the ramifications of the various specialties.

For some years the choice was comparatively simple, as it was practically a choice between ether and chloroform by inhalation. Today other anesthetics and other methods have widened and complicated the choice till it is sometimes confusing.

The most important and generally accepted anesthetics will therefore be described, and their choice and method of use, as influenced by certain factors, will be considered.

Regional Anesthesia

Under this heading will be considered the anesthesia produced by drugs which act locally, whether it is produced by surface application, by local infiltration, by field block, or by nerve block. By general acceptance procain appears to be the most safe and satisfactory drug for general surgery. Regional anesthesia exerts virtually no toxic action on the various organs of the body, and is therefore usually followed by a better postoperative recovery than is any other anesthetic. It should therefore be used where practical. However, it is time-consuming, and occasionally is insufficient in depth or extent, so that it has to be supplemented by a general anesthetic; and it may require self-control both by the patient and the surgeon. In spite of these drawbacks, its manifest advantages recommend it to a wider use than it now enjoys in suitable operations.

Spinal Anesthesia, while in reality a form of regional anesthesia of the nerve block variety, will, for convenience in wording, be considered separately in this paper, because it presents

*From The Lahey Clinic, Boston, Mass.

Read before the Annual Meeting of the Massachusetts Medical Society, Section of Surgery, Boston, June 11, 1929.

†For record and address of author see "This Week's Issue," page 542.

characteristics which are quite different from other forms of regional anesthesia. By its means, with a simple technic and a comparatively small dose of the drug, an anesthesia may be produced, which may be made quite extensive, and which is suitable for a wide variety of operations below the diaphragm. Its toxic action on the tissues is very low because of the small amount of the drug used in proportion to the extent of the anesthesia. Unfortunately it has inherent in itself certain elements of danger, which are not present in regional anesthesia, and which call for special caution in its use.

Ethylene appears to stand next to regional and spinal anesthesia in freedom from toxic action,[1, 2] though in this respect it does not have any pronounced advantage over nitrous oxid. Its advantage over this competitor lies in the fact that, being more powerful, it is effective when used with considerably larger amounts of oxygen, thus lessening or avoiding the anoxemia so intimately associated with nitrous oxid anesthesia. It also produces considerably more relaxation than does nitrous oxid, though this relaxation does not closely approach that obtainable with ether. It is valuable where a general anesthetic is desired and much relaxation is not needed. With variable amounts of ether added it forms an anesthetic of great flexibility and considerable power, combined with relatively low toxicity. Its great drawback is its inflammability. However, adequate precautions virtually eliminate trouble from this source. Nausea following its use appears to be somewhat more frequent, though usually not more prolonged than after nitrous oxid.

Nitrous Oxid has no toxic action in itself, but it may have an unfavorable effect because of the anoxemia which generally accompanies its use.[3, 1, 4, 5, 6] This anoxemia, with its danger and unfavorable effects, is greater than is the case with ethylene, and forms the chief reason why nitrous oxid is a less favorable anesthetic. It has the great advantage over ethylene, however, that it is non-inflammable. The anoxemia may be lessened and sometimes virtually eliminated by efficient preliminary narcosis. This combination, sometimes with variable amounts of ether, forms an extremely useful anesthetic, which is safe, agreeable, and very flexible, though it will not afford deep relaxation.

The term "gas" will be used in this paper to designate either ethylene or nitrous oxid.

Ether is the safest anesthetic in unskilled hands, and gives very good relaxation. Unfortunately it has definite toxic action. It depresses the function of the liver[3] and produces well marked tissue changes in this important gland.[1, 2] It depresses, sometimes severely, the function of the kidneys,[11] and may produce tissue changes here also.[1, 2] It raises the blood sugar, may produce acidosis, and causes postoperative nausea and vomiting. Locally it is an irritant to the respiratory tract, and tends to produce postoperative pulmonary complications. It is also inflammable. Because of these undesirable features other forms of anesthesia seem to us usually preferable. Ether, however, is very valuable when used in conjunction with the gases, and also where the gases or regional anesthesia are difficult to apply.

Chloroform has marked toxic action. It is dangerous during administration. It has severe toxic action on the liver and less on the kidneys and heart. There are so many other forms of anesthesia having little or no toxic action, that, while it may be valuable in small amounts as an aid to other forms of anesthesia, there does not seem to be any necessity longer to employ it alone for full anesthesia.

Ethyl Chloride has a toxic action similar in character to that of chloroform, but less severe. In this respect it stands between ether and chloroform. Its anesthetic action is very rapid and powerful. It therefore has great possibilities of danger, and requires an administrator who is accustomed to observing closely the signs of anesthesia. Under some conditions it is desirable for a momentary light anesthesia, or as a preliminary to other forms of anesthesia, notably ether, or in combination with them, but it appears to be too dangerous for other use.

Preliminary Narcosis is a valuable aid to all anesthetic agents, and may even be used, in part at least, as an anesthesia itself. In fact, there is no sharp dividing line between narcosis and anesthesia. By variations of the narcotic drugs and their doses, different states of the sensorium may be produced which vary all the way from a hardly perceptible dulling to an effect so profound that it amounts to a complete anesthesia of considerable depth. In its present stage of development, however, this latter state appears to be somewhat dangerous. A state somewhere between these two extremes is a great help to a patient having regional or spinal anesthesia, and makes safer an anesthetic agent such as nitrous oxid by lessening or even eliminating anoxemia.

A wide variety of drugs has been used and in endless combinations and dosages. Some of the drugs used are morphine, scopolamine, magnesium sulphate, paraldehyde, chlorbutanol, and various of the barbituric acid derivatives. Specially developed compounds, such as Avertin or Pernokton, hold out interesting promise for possible development in the future. The barbituric acid derivatives are especially useful where local anesthetic drugs are to be used as they exercise a well-marked protective influence against the convulsive toxic action of an overdose of these latter.[7, 8] Incidentally, magnesium sulphate has just the opposite effect, rendering the patient more suspectible to this action, so

that it should not be given in conjunction with regional or spinal anesthesia.[12]

CRITERIA OF CHOICE

In choosing the type of anesthesia, the dominant consideration must always be the safety of the patient; that is, his safety not simply as regards the immediate effect of the anesthetic, but rather as regards the complete procedure of anesthesia, operation, and convalescence.

Many other factors have a bearing on the choice of anesthetic and method of administering it. One patient may fear being rendered unconscious, while another fears remaining conscious; one may have had previous distressing experience with general anesthesia, while another has had similar experience with regional anesthesia. The ambulatory patient having a minor operation must be caused the minimum of disability. Much also depends on the characteristics of the surgeon, such as his speed, his gentleness of touch, or his need of complete relaxation.

It is impossible here to consider from all different angles the innumerable shades which these various factors throw on the question of choice. Rather two chief considerations,—the pathology of the patient and the site of operation,—will be discussed as they affect the dominant criterion of choice, the safety of the patient.

THE PATHOLOGY OF THE PATIENT

Respiratory Disease

This is a contraindication to the use of inhalation ether, as the incidence of postoperative pulmonary disease is decidedly greater under ether than under regional anesthesia or the gases.[9] Regional or spinal anesthesia appear preferable to the gases theoretically, but statistics do not definitely show this.[10]

Vascular Disease

In hypertension, it is preferable to avoid a rise in blood pressure such as frequently occurs with a general anesthetic. Either spinal or regional anesthesia are suitable in the essential form, but if there is arteriosclerosis, spinal anesthesia is less suitable and should be avoided if the sclerosis is extreme.

In hypotension, the use of spinal anesthesia must depend on underlying factors: it should be avoided in shock and in the seriously debilitated, but may well be used on a robust person with normally low blood pressure.

Heart Disease

Valvular disease without serious myocardial involvement affects the choice of anesthetic very little if there is not decompensation, and even with mild decompensation offers surprisingly little difficulty with all forms of anesthesia. In these latter cases, however, any raising of blood pressure is to be avoided. Spinal anesthesia is therefore very suitable, as well as regional anesthesia if excitement is avoided. Myocardial disease, with or without valvular trouble, offers much less certain ground. Any considerable change of pressure in either direction should be avoided. Spinal anesthesia is therefore less suitable and regional anesthesia becomes the preferred choice, though spinal anesthesia and the gases with ether may also be employed.

Kidney Disease

Here also procain is least injurious, though the harmful effect of the gases is so slight that they also may well be used. Ether, however, which causes well-marked depression of kidney function, should be avoided, or, if used, should be preceded by morphine, as this drug largely inhibits the injurious renal vasoconstricting effect of ether.[11]

Liver Disease

As the structure and function of the liver are affected definitely by ether, decidedly by chloroform, and probably also, though to a lesser degree, by anoxemia, these three are contraindicated in disease of the liver. Procain here also is the least toxic, with the gases, administered with sufficient oxygen, as alternative choices.

Disturbances of Metabolism

In hypermetabolic patients, the dose of preliminary narcotic drugs should be increased, and anesthetics having the least effect on the processes of metabolism, namely, procain, ethylene, or nitrous oxide, should be employed. The same anesthetic agents are to be preferred in diabetes, as ether produces marked abnormalities in carbohydrate metabolism. In the obese the dyspnoea or respiratory obstruction which often occurs under general anesthesia make spinal anesthesia valuable for them, particularly in abdominal surgery.

Where *shock* is present, regional, or, as second choice, light gas anesthesia is to be preferred, ether or spinal anesthesia usually being contraindicated because of their depressing effect on the circulation.

Clinically, young adults seem to require the largest doses of the various anesthetic agents to produce anesthetic and toxic effects respectively, while the two extremes of life require the least. Infancy is not in itself a contraindication to gas anesthesia, ethylene in particular making a very suitable anesthetic for a wide range of operation, yet these patients are so susceptible to anoxemia that skill, experience, and great care are necessary to make the anesthesia safe.

SITE OF OPERATION

Abdomen

In abdominal surgery, as the site of operation is reached through a muscular wall, and as sensitive structures are frequently encountered, there is need of an anesthesia which will suppress

powerful reflexes and produce muscular relaxation. Without such anesthesia the surgeon may be so hampered that his operation may be poorly done or even curtailed.

This need is admirably met by spinal anesthesia. The combination which it affords of extreme relaxation, contracted intestines, and quiet breathing offers operative conditions unrivalled and hardly even approached by any other form of anesthesia. These conditions are especially valuable in the very muscular or obese patient, and in difficult operations such as excision of carcinoma of the rectum or exploration of the bile ducts, as well as in peritonitis, both local and general, where they obviate to a considerable extent the dangers of protrusion, excessive handling, packing back of viscera, and spreading of sepsis. Moreover, the absence of toxic action on the tissues by spinal anesthesia makes it extremely valuable for the patient handicapped by disease of the lungs, liver, kidneys or heart. Under these circumstances we believe the total mortality from anesthesia and operation to be lower and the surgical results better than with any other form of anesthesia.

The combination of successful spinal anesthesia and effective preliminary narcosis is almost ideal. The patient falls asleep in his bed, and wakens there with the operation completed, having had an anesthesia which gives the minimum of organic toxic effects and the maximum of desirable operative conditions.

However, spinal anesthesia has certain dangers which require thorough knowledge and constant vigilance if they are to be avoided. Therefore, with easy subjects, simple operations, and patients not handicapped, its advantage is less marked and may be reversed. The question of its advantage is also influenced by the fact that it is more dangerous if high enough for an upper abdominal operation than it is if suitable for a lower abdominal operation only. On account of the frequent occurrence of vascular depression, it is not suited to those who present a desperate risk, whose pulmonary space is markedly lessened, or whose vigor is seriously diminished as by shock, hemorrhage, or prolonged sepsis. Surgical intervention in this latter class of patient is usually very urgent, and deep relaxation may well be foregone in order to reduce the burden of anesthesia to the minimum. Here anesthesia by field block is to be preferred, with the addition, if necessary, of ethylene with sufficient oxygen to prevent anoxemia.

Spinal anesthesia should never be given in any event unless administered with great care and guarded with every precaution. Where no one well versed in its administration is available, ethylene or nitrous oxid may be employed when they will give sufficient relaxation,—regional anesthesia when demanded by the pathology of the patient, and ether in other cases. Ether continues to occupy an important place in abdominal surgery, since it is well tried and tested, has been the standard for many years, is always available, as it may, under necessity, be given even by a novice, gives good relaxation, and is safe as regards immediate effects.

Trunk and Extremities

For operations on the trunk (exclusive of the abdominal cavity) and on the extremities, deep relaxation is seldom needed, except in a few instances to be mentioned later, and ether is therefore seldom indicated. Either nitrous oxid or ethylene on the one hand, or regional or spinal anesthesia on the other, cover practically every need. For many of the operations the gases or regional anesthesia are equally applicable, so that choice is to be made on the basis of some of the minor factors previously mentioned, such as the preference or convenience of the patient or surgeon. Into this category would fall minor or superficial operations of all sorts, resection of ribs, simple amputation of breast, operations on the external genitalia and perineum, and on the hands and feet. For other operations, while a choice of methods is available, usually some one method is preferable. Thus, though many orthopedic operations may be done under regional anesthesia, yet if much hammering or sawing is required, the unconsciousness afforded by gas is to be preferred. On the other hand, in operations on the anus and rectum, and to a less extent in operations on the urinary bladder, the relaxation of spinal or regional anesthesia is of great value. A truly low spinal anesthesia, one which is comparable in extent to a sacral anesthesia, is so safe that there is little choice between the two. Spinal anesthesia is also safe and, in handicapped patients, is suitable for amputations of the lower extremities.

When the thorax is to be opened, the expansion of the lungs should be maintained by the administration of one of the gases under accurately controlled pressure.

Head and Neck

For operations where the fields of the surgeon and anesthetist can be kept separated, such as operations upon the thyroid, mastoid, and cervical lymph nodes, especially when infected, gas anesthesia is well suited. It may also be used by means of a nasal inhaler for operations in the mouth and for some on the face.

In the majority of operations, however, especially about the head, there is apt to be interference between the surgeon and anesthetist. Here regional anesthesia becomes very desirable. Field block of the scalp is well suited for operations on that structure, on the cranial vault, or on the brain. Superficial operations on the face and practically all operations in the mouth, the nose, and the nasal sinuses may be done under infiltration, field block, or blocking of the sensory nerves. In surgery of the anterior part of the neck, regional anesthesia is applicable as well as gas, various combinations of cervical

plexus block, field block, and infiltration giving satisfactory anesthesia for nearly all the usual operations. In thyroidectomy the addition of a very brief general anesthesia is helpful while the lobes are being elevated from their beds. In all these operations the discomfort caused by the position on the table, by drapings, and by the location of operation should be prevented by free preliminary use of narcotic drugs. Regional anesthesia is difficult to use for the posterior aspect of the neck and should not be used where the needles may have to traverse infected tissues, as in preparing for the drainage of abscessed cervical lymph nodes.

Whenever it is desired not to use regional anesthesia, either pharyngeal or intratracheal ether is an excellent method. As anesthesia need not be deep, the toxic effects of ether are lessened, and in the intratracheal method may often be reduced to a negligible quantity by using ethylene or nitrous oxid for maintenance. Interference between surgeon and anesthetist is reduced to the minimum. Inhalation of blood and detritus is prevented by the gaseous currents in intratracheal insufflation, and in the pharyngeal administration by the use of two nasal tubes with packing off of the throat for oral operations, and an oral tube with posterior nasal pack for operations on the nose. In the intratracheal method, simplicity of apparatus may be gained by the use of a large tight-fitting intratracheal catheter with to and fro breathing, after the method of Flagg or of Waters and Guedel.

Colonic ether likewise eliminates interference between surgeon and anesthetist, and is free from the irritant effects of inhaled ether on the respiratory tract. However, it is occasionally irritant to the intestinal tract. By employing a suitable technic, induction need not be prolonged, and the planes of either analgesia or full surgical anesthesia may be obtained. The exhaled vapors have proved clinically not to be explosive, so that it may be used in the presence of a cautery within the upper respiratory passages. It is particularly valuable for cases in which tracheotomy has been done previously as well as for operations carried on through the esophagoscope or bronchoscope.

SUMMARY

While there are a multitude of factors which may influence the choice of the anesthetic in each case, yet in general the choice is governed by a few broad considerations. Of these, the safety of the patient is paramount.

Of the more commonly used drugs, procain is the least toxic and ether by far the most toxic, ethylene being the least injurious of the inhalation anesthetics.

For abdominal operations, spinal anesthesia is preferred where technical difficulties are anticipated, and field block by procain, reinforced, if necessary, with ethylene for patients in poor condition. In others, gas, ether, regional, or spinal anesthesia may be used, but the choice among these methods will be less definite and will depend upon a variety of factors.

For most operations on the trunk and extremities, either procain, including its intraspinal administration, or one of the gases may be used; ether is rarely indicated. For operations on the anus, rectum, and urinary bladder, regional and spinal anesthesia are preferred because of the deep relaxation they afford.

For operations on the head and neck, interference between anesthetist and surgeon may be avoided by using regional anesthesia or intratracheal ethylene or nitrous oxid, or the more toxic drug ether by pharyngeal, tracheal, or colonic administration. Where the fields of the anesthetist and surgeon need not overlap, either gas or regional anesthesia may be used.

REFERENCES

1 Stander, H. J.: Amer. J. Obs. and Gyn., 12: 633-654 (1926).
2 Yates, J. L., and Raine, F.: Ann. Surg., 87: 124-129 (1928).
3 Rosenthal, S. M., and Bourne, W.: J. A. M. A., 90: 377-379 (1928).
4 Van Liere, E. J.: Am. J. Physiol., 82: 727-732 (1927).
5 Martin, H. G., Loevenhart, A. S., and Bunting, C. H.: J. Exper. Med., 27: 399-412 (1918).
6 Campbell, J. A.: Brit. J. Exper. Pathol., 8: 347-351 (1927).
7 Tatum, A. L., Atkinson, A. J., and Collins, K. H.: J. A. M. A., 84: 1177 (1925).
8 Leshure, J.: J. A. M. A., 88: 168-169 (1927).
9 Lundy, J. S.: Med. J. and Record, 124: 87-93 (1926).
10 Sise, L. F.: Curr. Res. in Anesth. and Anal., 6: 163-168 (1927).
11 Haines, W. H., and Milliken, L. F.: J. A. M. A., 85: 1853-1855 (1925). J. Urol., 17: 147-153 (1927).
12 Knoefel, P. K., and Herwick, R. P., and Loevenhart, A. S.: J. Pharm. and Exp. Therap., 33: 265 (1928).

CHAIRMAN TRUESDALE: The next reader has come a long distance and at no little inconvenience. The tree of his surgical activities has blossomed and flowered in a very large metropolitan district, but the root of his medical education remains well grounded in Copley Square. He has covered all the intervening section. He always brings back laurels to the yard of his alma mater. Dr. Eugene H. Pool, of New York. (Applause.)

DR. EUGENE H. POOL, New York City: *Mr. President and Gentlemen*—It was no inconvenience, I assure you. I jumped at the opportunity, as I always do, to come to Boston.

POST-OPERATIVE TREATMENT*

BY EUGENE H. POOL, M.D., F.A.C.S.†

POST-OPERATIVE treatment may be subdivided into routine measures and the treatment of complications.

The first of these will be considered in a broad way without entering into details; these are given in textbooks, and a book of rules for post-operative treatment can be found in almost every ward. But I hope that such rules are not followed too closely. Therapy should not

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†For record and address of author see "This Week's Issue," page 542.

be carried out by rule of thumb, as was done not so many years ago when one regularly ordered "2-10 and ½" on the night before operation and "2, 10 and ½" on the second night after operation (Calomel gr. ii, soda bicarb. gr. x; Mag. Sulph. ℥ ss.). Every case should receive careful thought to determine what treatment, if any, is indicated. This is best done by quietly sitting down beside the patient and giving consideration to the individual case. Therefore, while general policies and choice of drugs are proper, thought should be given to each case at the time of their employment.

Another feature which I think is essential though obvious is unlimited consideration for the comfort of the patient. Small details mean much in this connection, for instance, care of the mouth and bowels, the relief or prevention of thirst, persistent vomiting, hiccough, backache, gas pains, distended bladder, sleeplessness, tight bandage, or pressure of a splint. But special emphasis should be placed upon gentleness in examinations and dressings. Too often one sees the examiner's or the dresser's hand suddenly shoot out at the wound or other sensitive part instead of subtly approaching it; too often the drain is suddenly jerked instead of gradually being worked free. The fingers or instruments should move and alight with the gentleness of a butterfly after warning and encouraging the patient.

Unless the causes of discomfort are borne in mind, they will not be prevented or recognized sufficiently early. Prevention is far better than correction; such a policy does much to spare both the patient and the surgeon. Ante-operative preparation is of vital importance in this connection. I would emphasize especially fluids, alkalies and carbohydrates for several days before operation; evacuation of the bowels prior to operation but in general no cathartic on the night before; and care that operation is not undertaken while the patient has any acute respiratory infection. Therefore the patient, if possible, should be observed and instructed for several days before operation, and in grave cases should be in the hospital during this time and not sent in the night before for early morning operation. In certain types of cases and poor risks elaborate study and preparation are essential.

I will pass over operative details except to note that the choice of anaesthetic is of importance and that a cushion should support the lumbar spine during and after operation.

Quiet; change of position; ample sedatives, for instance pantopon; clyses, or fluids by rectum; rectal tube, enema or colonic irrigation as indicated, as a rule can be relied upon to prevent undue discomfort. Retention of urine usually can be relieved, especially in women, by the injection per rectum of hot glycerine if simpler measures fail. In males, it is often preferable to allow the patient to stand up, if he cannot void in bed, rather than pass a catheter. In a recent case of gastro-enterostomy in a man of 73 this was done from the first night, as it was feared that frequent catheterizations would infect the bladder.

The surgeon himself should be best qualified to direct routine post-operative treatment, except in diabetes and hyper-thyroidism and in infants. In these, medical treatment under the most expert direction should be carried out after operation with the same assiduity and attention as before operation. Surgery in these is as a rule a detail and in no wise should change the control of the case.

When certain complications arise, especially pulmonary, a medical consultant must often be called in. But even in these a properly qualified surgeon should be able to diagnose the condition. The surgeon of the present should be, the surgeon of the future must be, an experienced internist. A young man should serve as a medical house officer before specializing in surgery.

In a word, successful post-operative treatment is best ensured, first, by recognizing the probability or tendency to certain complications and taking measures for their prevention; and second, by recognizing complications at an early stage in their development. Few drugs are necessary; fancy therapeutics should play little if any part.

Certain modifications should be made in treatment according to the age of the patient. In old people special precautions must be taken to prevent pneumonia; moreover, these patients do not tolerate large doses of anodynes, which should be employed sparingly. In one of my patients, an old man having had an amputation, a large dose of Hyoscine was given. The patient slept it is true, but the sleep was succeeded by coma and fatal pneumonia followed. This is not an unusual occurrence.

In young children, the pediatrician should direct post-operative treatment. Only a few features need be emphasized. Breast feeding is advisable whenever possible; erysipelas is relatively frequent and should be recognized at once; otitis media is not uncommon and should always be looked for in cases not doing well; post-operative bleeding and complete separation of the wound with evisceration are relatively more frequent in the young, therefore extreme care should be taken in hemostasis and repair of an abdominal wound.

Post-operative psychoses. Aside from the common neurotic and delirious conditions observed after operations there are occasional frank psychoses which have not been anticipated by the surgeon and frequently complicate the period of convalescence. In a large proportion of these cases a careful history by a physician who has had psychiatric training will disclose psychotic tendencies or episodes.

Often a brief interview will disclose the presence of eccentricities or at least arouse the curiosity of the surgeon sufficiently to request psychiatric consultation. It is very important to give the patient opportunity to describe his illness and his symptoms in his own words. Such a description often reveals complaints which are obviously not associated with the suspected surgical condition. A few illustrative cases will show the unfortunate consequences of the failure to make these preliminary observations.

CASE I. A woman aged thirty-three with fracture of left femur at junction of upper and middle third. Surgical history devoid of any indication of an unusual personality. Psychiatrist learns that she was a patient at Manhattan State Hospital for two and one-half years. During interview she stated that she had "acid in her body," "could feel it moving about" and she wanted to know why her leg was stiff and swollen. She apparently did not recognize the need for immobilization. The psychiatrist had been called in consultation after the patient had removed the apparatus.

CASE II. A woman aged twenty-nine complaining of pain in the abdomen of eight weeks' duration. Diagnosis of chronic appendicitis. Exploratory laparotomy with appendectomy. No other pathology found. No difficulty in convalescence until eleven days after operation when patient began to behave peculiarly. That night she drank a bottle of hair remover with suicidal intent. Her stomach was washed out and she was placed under special observation. The next day she was removed from the hospital against advice. Two days later she was returned to the hospital and at that time a psychiatrist elicited definite suicidal tendencies associated with homosexuality and recommended that she be kept under constant observation until removed to a psychopathic hospital. The next day she was again removed by the mother against advice. That evening she drank a bottle of iodine and became so unmanageable that it was necessary to remove her to Bellevue Hospital.

It appears that in this case an operation was performed without definite indications, that the symptoms may have been in large part due to an emotional situation, and finally that the operation may have been a definite factor in precipitating a serious psychosis.

In such cases it is desirable to have a psychiatric history or consultation so that the surgeon may be aware before operation of the additional risk; moreover, since pre-psychotic persons not uncommonly have complaints which appear genuine to the inexperienced, it is necessary to have the additional information to arrive at a correct diagnosis.

A person who has had a psychosis or who has psychotic tendencies is more likely to have delirious reactions or psychotic episodes following operation. Such persons usually can be treated surgically without undue risk provided their tendencies are known. It is highly improbable that the patient with the fractured femur would have succeeded in removing the cast had she been given psychiatric nursing attention.

Not uncommonly there are patients who appear to the nurse and surgeon to be uneo-öperative when as a matter of fact co-öperation is limited or absent because of mental illness. If the surgeon confines his interest to purely surgical matters he will seldom detect this complication. If on the other hand he has been trained to deal with the entire individual he will usually be able to anticipate and avoid such difficult situations.

We have had the benefit of regular visits and advice from Dr. George W. Henry of Bloomingdale Asylum, to whom I am indebted for the above information.

A fairly prolonged stay in bed after a celiotomy (usually from one to two weeks) is recommended by most surgeons. It is manifest that early release from bed is done at the sacrifice of proper wound repair. The adoption of systematic exercises during this period provides almost all of the advantages gained by a shortened stay in bed, without interfering with the repair of the wound. The exercises do much for the comfort of the patient and also render him less weak after getting out of bed. As bearing on the question of danger from thrombosis and embolism, it is significant that importance is ascribed by most authorities to retardation of the blood-stream in the etiology of thrombosis. Therefore such exercises probably diminish the danger of embolism by stimulating the peripheral circulation. (*J. A. M. A.*, 1913, LX, 1202.)

Walters of the Mayo Clinic tries to produce an increase in the rate of circulation by administering thyroid from the third day after operation. He believes that this increases metabolism, blood pressure and flow of blood.

So much for routine measures.

Post-operative complications constitute the important feature in such a discussion, but they are far too numerous to cover adequately. We naturally think of shock, hemorrhage, pneumonia, obstruction of the bowels, suppression of urine, embolism and infection. We cannot consider the treatment of all of these but we can and must emphasize again the importance of preventive measures, especially in the avoidance of shock and post-operative hemorrhage. If shock occurs, quiet, heat and fluids, especially transfusions are indicated. In the case of post-operative hemorrhage the treatment consists in the arrest of hemorrhage and the restoration of the patient by the same measures as are advocated for the treatment of shock.

Pulmonary Complications. Great care should be exercised to avoid exposure especially during transit to and from the operating room and while the patient is sweating after operation. In our experience, ethylene with a small amount of ether if necessary is the best routine anaesthetic for the comfort of the patient and for the prevention of respiratory infections. In selected cases local, regional or spinal anaesthesia is preferable. In our experience the incidence of respiratory infections has been diminished since ethylene has been the anaesthetic

of choice but it must be admitted that during these years greater efforts also have been made to observe the obvious precautions for the prevention of respiratory infections.

I will quote our figures:—In a five-year period from 1924-1929, 5995 operations gave 192 pulmonary complications 3.2%; of these, 115 were definite pneumonias. 26 or .43% died of pneumonia (these include 6 deaths due to embolus). It is of interest to note the preponderance of involvement of the right lower lobe (63.5% of the pneumonias). Ethylene has been in general use since 1926 and during that period there has been a marked reduction in the pulmonary complications. Thus, in 1924 and 1925, there was an average of 60.5 a year; in 1926, 27, 28, only 23.3 a year; definite pneumonias were in similar proportions, i.e. 38.5 to 12.7.

It is interesting to note that encouraging work is being done at the Mayo Clinic and elsewhere with intravenous anaesthesia. Amytal (Sodium Barbital) is being employed with marked success and it may be that intravenous anaesthesia will be the method of election in the not too distant future.

Careful nursing is of the utmost importance. The patient should be placed on the side so that mucus and vomitus will be less likely to be aspirated. Later when the patient is out of the anaesthetic the Gatch or Fowler Positions are of benefit with frequent turning from side to side.

To what extent post-operative pneumonias are embolic is uncertain, yet there is evidence that some arise from this cause, for instance, the fact that they occasionally occur after local or spinal anaesthesia. Moreover certain characteristics of many post-operative pneumonias suggest embolic origin. Fortunately, post-operative pneumonia usually resolves with disappearance of the symptoms in from three to four days by lysis with a gradual clearing up of physical signs. In a ten-year analysis it was found on our Service that nearly all of the pneumonias (92 per cent.) followed abdominal operations and the incidence was relatively greater after operations on the upper abdomen. (Vedin.)

It is advisable to have taken an early x-ray of the chest in suspected cases of pulmonary involvement.

Massive collapse of the lung has recently received much attention. It is a condition of atelectasis which is confined to one lung, or to one lobe of a lung. The alveoli are collapsed and devoid of air. The condition usually occurs after laparotomies under general anaesthesia, but may occur after local anaesthesia. It has been observed after operations on almost every site. The most commonly accepted theory of causation is that a plug of mucus accumulates in the bronchus and is not dislodged by the usual respiratory wave or cough. Complete closure of the bronchus results. The air is then absorbed in the parts of the lung supplied by the bronchus. The condition is most often seen in young males and often they have taken the anaesthetic badly, showing much mucus and cyanosis.

Massive collapse occurs soon after operation—as a rule before the fifth day. The patient usually complains of a feeling of tightness in the chest and respiratory difficulty. The condition is characterized by cyanosis and usually fever; other symptoms vary, as pain in the chest, cough, increased respirations and pulse. The important physical signs are deviation of trachea and displacement of the heart to the affected side, restricted respirations and restricted excursion of the costal margin on the side affected; dulness, diminished fremitus, absent breath sounds or tubular breathing, and râles of various kinds; but the actual lung signs are inconstant. It is as a rule unwise to disturb the patient for a complete physical examination. If the condition is kept in mind the diagnosis can usually be made readily by deviation of trachea and heart and limited respiratory excursions.

X-ray is pathognomonic. It shows an area of great density corresponding to the collapsed lobe or lung; heart and trachea displaced to the affected side and the diaphragm of that side elevated. Since the condition is probably due to a mucous plug in a large branch of the bronchial tree, the earlier this is removed the better. Some have advised aspiration under bronchoscopy. But this is too heroic and is not to be recommended. Success often follows the simple procedure of turning the patient with affected side uppermost and then stimulating coughing by striking him a hard sudden blow. Frequently a mouthful of thick mucus is coughed up; and x-ray a short time later, even within an hour, may demonstrate a completely normal lung; though subsidence of the collapse usually occupies 6-12 hours; sometimes longer. But in any event the prognosis is good in cases uncomplicated by pneumonia and, fortunately, the massively collapsed lobe or lung is rarely followed by pneumonia.

Abdominal complications:—Acute dilatation of the stomach causes abdominal distress, marked thirst, regurgitation and ultimately collapse. The condition must be kept in mind as a possibility even at the time of or immediately after operation; it should be recognized and treated at once. Lavage or a continuous duodenal tube are indicated, also free administration of sodium chloride solution.

The vomiting of acidosis is best prevented by fluids and alkalies before operation, but if it occurs free fluids, glucose, alkalies and bromides will usually arrest the condition.

Let me emphasize an important point which is not in general recognized, namely, the value of getting an early x-ray of the diaphragm in any case where a subphrenic collection is likely to develop, as in a perforated ulcer or diffuse

peritonitis which is not progressing well. Such an x-ray gives one the normal level of the dome of the diaphragm. In the event of unexplained complications, changes are more readily appreciated. Individuals vary enormously in the relative heights of the diaphragm on the two sides. I have repeatedly seen a high diaphragm on the right side where it was difficult or even impossible to determine whether it was raised by a subdiaphragmatic collection. An early x-ray record for comparison would in such a case avoid confusion. We try to have such a check at an early date, sometimes even before operation.

In acute suppression of the urine in addition to hot packs and other routine measures, glucose intravenously in high concentration is indicated.

In post-operative hemorrhage in jaundice, transfusions will often control the bleeding; at times they must be repeated.

In abdominal cases with peritoneal infection, paralytic or mechanical ileus is not infrequent and here the question of high enterostomy (jejunostomy) often must be considered after the usual measures have failed; as enemas, colonic irrigations, pituitrin, etc., with repeated lavage and intravenous administration of hypertonic sodium chloride solution.

We have tried the procedure in a considerable number of cases and have come to the conclusion that it is best adapted to those cases in which obstruction and distention have been of slow and gradual development. Thus, where the symptoms, such as vomiting, distention and obstipation are present 5-7 days after operation high enterostomy may be expected to be life saving; in early cases, however, presenting the picture of toxaemia associated with diffuse peritonitis, it has not proved of value. Here there is a paralytic ileus, in contrast to the class cited above where a mechanical ileus is present.

Occasionally one is faced with the treatment of a duodenal fistula. This is refractory on account of the nature of the secretion. If this is allowed to accumulate, it digests and prevents agglutination and adhesions. The patient should be kept upon the face as much as possible so that constant free drainage is established, thus no pocketing is allowed and the tract is favorable for spontaneous closure. If, however, this fails, high jejunostomy should be done to feed the patient; the duodenal contents are aspirated by continuous suction from the fistula and reintroduced through the enterostomy tube. At the same time appropriate nourishment is also introduced through the tube. (cf. Erdman—*Annals of Surgery*, 1921, LXXIII, 793.) Irritation of the skin can be prevented by the measures advocated by Potter namely, the application to the skin around the fistula of beef juice (Bovinne) and -1/10 normal hydrochloric acid solution. The acid inactivates the pancreatic juice, but if there is an excess it exhausts itself by digesting the beef juice, rather than the protein of the skin.

We have referred to the suction apparatus in connection with duodenal fistula. Continuous aspiration offers advantages in many other post-operative conditions.

"The varied conditions for which this method of continuous suction is desirable readily suggest themselves. For example, any deep wound with difficult uphill drainage, where the patient is constantly suffering from wound absorption; all cases where the discharge is irritating to the surrounding skin, as fecal fistulae, pancreatic wounds, etc.; cases in which the discharge is very profuse and the patient is made uncomfortable by being continually wet or is annoyed by frequent dressings."

The details of the apparatus are given by Kenyon in Johnson's Operative Therapeusis, Vol. I, 229.

Wound Repair. Only one feature of wound repair need be referred to namely, disruption or evisceration. Occasionally an abdominal incision especially one in the epigastrium opens up. This is one of the catastrophes of surgical after-treatment. Its direct etiology may be: faulty technique in the wound closure or suppuration in the wound. Indirectly, a contributory cause is any sudden activity or exertion on the part of the patient, especially persistent coughing or vomiting. Wound disruption in cachectic carcinoma cases is of a different type and is apt to occur without undue exertion as a result of deficient reparative powers. Disruption may occur at any time during the post-operative course, but it is most frequent about the end of the first week. The feature that I want to emphasize is that such an early separation as well as a late hernia is in most cases due to separation of the deep layer. You will recall that the transversalis muscle, fascia and peritoneum in the upper abdomen are practically one layer. The muscle fibres run transversely; each respiration separates the costal arch to which the muscle is attached and through the pull of the attached muscle pulls on the deep row of sutures. The sutures more readily tear out because they are placed parallel with the muscle fibres. With the above in mind adequate precautions always should be taken in the suture of such wounds. I will not enter into details.

When from a recent laparotomy wound there occurs a discharge of a large amount of serum, usually blood tinged, especially if the patient is vomiting and not doing well, it may be suspected that a knuckle of bowel has projected and become caught in the depth of the wound. Such a wound should be reopened and the knuckle of bowel replaced, otherwise complete opening is likely with evisceration. In the event of evisceration the prolapsed intestines should be restored to the abdomen as quickly as possible. In the performance of this a suction ap-

paratus connected with a small caliber needle for evacuating gas sometimes is of aid in replacing the eviscerated loops and minimizes the shock attendant upon handling of distended intestines. When immediate suture is not feasible, a satisfactory means of controlling the intestine is the large Mikulicz tampon.

Infections. It may be of interest to note that in our Ward Service infections of all degrees in clean cases are about 3%. Local treatment need not be discussed except to state that I am a firm believer in the Carrel Dakin method provided this is carried out in all details as described by its originators. But too often the dressings are carelessly done and the results are correspondingly disappointing. When the wound has become clean, secondary suture is often advantageous. But careful bacterial checks are imperative.

Localized collections of pus must be sought for and drained and here I wish to call attention to a feature which is not always recognized namely the value of opening a focus which points into the rectum through the rectal wall.

There is no specific treatment for bacteriaemia or septicaemia. Vaccines, foreign proteid and transfusions occasionally are of value.

In persistent uncontrolled infections, for instance following nephrectomy or in a child with multiple foci of osteomyelitis, sunlight treatment is often remarkable in its effects, preferably direct heliotherapy, but this failing, artificial heliotherapy is a good substitute. Such unusual infections as tetanus and gas bacillus infection cannot be discussed.

Thrombosis. Post-operative thrombosis may occur in a number of situations though we usually associate the condition with the femoral and pelvic veins which are the most frequent. Slowing of blood stream, certain obscure alterations of the blood elements, possibly the platelets, a low grade infection, are probably causative factors.

Treatment, notably rest, is strongly indicated to prevent two serious sequelae, embolism and suppuration.

Pulmonary embolism which may be the end result of thrombosis, usually, if not always, originates in the femoral vein, though possibly a pelvic phlebitis may be the site of origin.

In ten years on our Service there were 21 cases of pulmonary embolus in 12,615 operations. These cases gave no clinical signs of a pre-existing phlebitis or thrombosis except in one case of carcinoma of the pancreas.

During the ten same years, there were 34 cases of phlebitis, or approximately 1 in 330; only one resulted in embolism. (cf. Vietor—*Annals*, 1925, LXXXII, 194.)

Preventive measures tending toward the avoidance of thrombosis and embolism should be aimed at in order to decrease as much as possible these serious complications.

The possible value of exercises has been suggested.

Bancroft is now doing work which encourages the hope that the nature of the blood changes favoring thrombosis may be recognized and prevented. If his hypotheses prove valid and their application practical, much may be accomplished in the direction of prevention.

The Trendelenburg operation for removal of the embolus from the pulmonary artery has been successfully performed in a few cases, yet it does not seem a promising procedure for the following reasons:—

1st. A certain number of cases recover.

2nd. The majority die before operative interference can be instituted.

3rd. The method is applicable only to the small group who live for an appreciable time, but would die if not relieved; a difficult decision. Yet occasionally a patient's life is prolonged for as much as 24 hours. We have seen this in 2 cases with patent foramen ovale. In such cases especially, operation might be feasible.

Septic thrombophlebitis always induces a serious clinical picture. The thrombus may involve the lateral sinus, a tributary of the portal vein, the pelvic veins or veins of the extremities.

The femoral vein is a frequent site of thrombosis, and occasionally of septic or suppurative thrombophlebitis.

A septic thrombus is at first a local and solitary focus of infection. From it micro-organisms are passed into the general circulation and may be recognized by blood cultures. The clinical picture is typical of sepses. This condition persists for a variable period before secondary abscesses or septic infarcts or true septicaemia develop. Under such conditions, isolation of the infection by proximal ligation of the vein may arrest the disease. The prognosis under such treatment is most favorable in early cases, especially when blood cultures are not constantly positive, indicating an intermittent bacteremia. By the study of repeated cultures an expert bacteriologist can form some opinion as to whether the organisms are merely passing in the blood stream (bacteraemia) or are propagating in the blood stream (septicaemia). He depends largely upon the number of organisms and the rate of increase in successive cultures.

A patient who presents the signs of phlebitis with unexplained persistent septic temperature and positive blood cultures is entitled to operation upon the involved vein if this is accessible.

The operation can be performed on veins of the extremities under local anaesthesia without serious discomfort.

The *preservation of function* must ever be borne in mind. Thus, after a breast amputation, the completely abducted position will ensure almost 100% function at the end of convalescence. In lesions of the extremities the possibility of drop foot must be thought of and prevented;

and the mobility of the fingers and wrist must be conserved. With the relative perfection of surgical technic and asepsis the operator has been relieved to a large extent of anxiety as to mortality and infection and therefore greater efforts may appropriately be directed to the limitation of discomfort and the restoration or preservation of function.

I am indebted to my colleagues on the Second Surgical Division for assistance in preparing this paper, parts of which are taken from their articles.

CHAIRMAN TRUESDALE: We have heard very excellent gospel in these three papers. They have been refreshing, enlightening, and I am sure I express the sentiments of everybody here when I say they have been very much appreciated. The lure of the trout brook has taken Dr. Daniel F. Jones away, so I am going to ask Dr. Lund if he will open the discussion.

DISCUSSION

DR. F. B. LUND, F.A.C.S., Boston: *Gentlemen*, you can't realize how much I have enjoyed these papers, because I attempted in my feeble way to take up two of the subjects, anesthesia and the importance of preoperative medical care, in a short paper I read before the Medical Section this morning.

Devoting a paper to each subject has made possible a very thorough presentation. In regard to Dr. Mason's paper, I think he has brought out very beautifully the importance of co-öperation between the medical and surgical staff, and I noticed that Dr. Pool alluded to that same subject when he said that in hypothyroidism, diabetes and infants, the surgery is a mere incident as a part of the medical treatment. I have found that especially true in diabetes; that if I cut off a man's leg or if I treat a sore toe, I am simply the dresser and that man is helped, if he is helped, by the careful treatment, getting the sugar out of his blood, and that has got to be done by a medical man with a lot of diagrams and a lot of careful work that I don't know anything about.

We must not forget, of course, that in the ordinary surgical case, the surgeon has to be boss, and that a medical man will not generally, I think (without any disparagement of the medical man), interpret acute symptoms as accurately as a surgeon who is doing that sort of thing all the time. That doesn't apply to all of them, because some of them are very keen on surgical diagnosis.

Dr. Sise's paper was so thorough that it leaves very little to be said. I have been delighted with the relaxation, in what work I have done, with spinal anesthesia. I have had only about fifty cases. I like to use ether in ordinary healthy patients where the little damage to their liver and their kidneys is not to be considered at all, if it is given by an expert and they don't get too much, and also if they are in good health and the condition that you are operating for is not serious. Where we are confronted with any pulmonary or respiratory complications and certain cardiac conditions, (with the exception, as Dr. Sise has said, of arteriosclerosis), and are employing spinal anesthesia we sometimes have some worry on the operating table, but not much, if a man is handy with his ephedrin and his venous infusion of salt solution, and the postoperative complications that we worry about with ether are not present.

I regret to say we have not used ethylene in our hospital because we are afraid to do it. We get along very well with gas and oxygen where the gases are needed.

I was very much interested in what Dr. Pool said about taking an x-ray of the diaphragm before the operation. I have just seen a case where a prominent man with a large abdomen had a pain in his back and subdiaphragmatic abscess was supposed to be the diagnosis because his diaphragm on the right side was high. When you came to look at the diaphragm, you saw it started in the middle and went straight up in an oblique line to the side of his chest. In other words, maybe when he was a child, he had a pleurisy which caught his diaphragm up to that side of the chest. All this fuss about subdiaphragmatic abscess had delayed an operation on a gall-bladder which needed to be done for several days. That same man had had a high appendix removed which extended almost up to his diaphragm and was gangrenous. I think that it is an excellent suggestion, in cases where you suspect subdiaphragmatic abscess, to deal with that by a preliminary x-ray.

I believe that it is a most interesting observation that embolism starting with the femoral artery, as Dr. Pool has said, seldom occurs in cases which have phlebitis, which is just where you would expect that it would appear, and I do believe that the exercises in bed will prevent phlebitis as Dr. Pool suggests. I have always suspected and have always been taught (I have no evidence), that phlebitis was due to some low-grade infection, but I am also afraid of it in anemic cases. I have just been through a case of phlebitis, where I am sure there wasn't any infection, a hysterectomy, where there was a high-grade of anemia. I think we may find out possibly by a study of the blood in the future, the cases in which we may have reason to fear phlebitis.

It is a great comfort to know that embolism rarely results from femoral phlebitis and may enable us to get our patients out of bed a little earlier.

CHAIRMAN TRUESDALE: If I may be permitted to say a word on that interesting case that Dr. Lund just reported with the high diaphragm, I would add another thought in the probabili-

ties of the etiology. It may be that that individual had an obstetrical paralysis of the right phrenic nerve, causing an eventration of the right diaphragm. That might account for the high ascending colon. It is just one of the possibilities.

Dr. Frederick B. Sweet is next on the program but he is not here. He was unable to come, so I am going to ask Dr. Brewster to take part in this discussion, because I know you will all be very much interested to hear what he has to say.

Dr. George W. W. Brewster, F.A.C.S.: I thank you, sir. I had no thought of discussing the papers, but I am glad to have the opportunity to say one word about Dr. Mason's very well-written and interesting paper. This subject of the co-öperation of the physician and surgeon dates back quite a way, and you will remember that Maurice Richardson early in his career talked about the importance of the co-öperation of the physician and the surgeon.

I think the first paper I ever read (I know it was in an out-of-town medical society) was on the subject of the co-öperation of the surgeon and the physician. I feel sure that it wouldn't be fair to attribute to Dr. Mason some of the thoughts that underlie our appeal to the physicians. Of course, we wanted and we did try to co-öperate with them whenever we could.

Dr. Mason's subject, of course, is much more serious and I don't mean to make light of it. Each year there is an appeal in almost all medical meetings; some man writes on this subject, and I think it is one that should be brought up every year. The growth of the clinic and the possibility of diagnosis today in the hands of these very scientific and very active younger men is a great lesson to some of us who have not had the advantage of practicing our specialty or our work in that method.

At the same time, with the growth of the clinic and the group, there are still patients who prefer the individual care and study of one man. There will always be a certain number of patients who can be handled by the individual.

When Dr. Sise says anything about anesthesia, I feel sure it comes from a man who has made for himself a unique position in this community. I think we would all agree that his position as an anesthetist is not surpassed by anyone. There is no discussion on whatever he says. It is based on experience and knowledge and observation which we have been watching for many years.

As Dr. Pool represents the same position as that of Dr. Sise, I wouldn't dare make any remarks about it. It is a fine paper. (Applause.)

Chairman Truesdale: I think Dr. Cheever is not here. He is occupied by the Council.

I am going to call on Dr. Lincoln Davis.

Dr. Lincoln Davis, F.A.C.S., Boston: *Mr. Chairman and Gentlemen*—I was sorry that on account of the other meetings that are going on I missed the first and second papers and only heard about half of Dr. Pool's paper.

Undoubtedly, if the examination and preparation of the patient for operation are thorough, if the choice of anesthesia is wise and it is well administered, and if the operation is properly performed, there will be fewer postoperative complications. The fact that a surgeon of the standing, reputation and extreme operative skill of Dr. Pool is able to report such a list of complications, shows to us that many of these complications are inevitable, and every man of experience is bound to meet them. I regret to say that I have had a very large experience in postoperative complications. They are the nightmare of surgery. I wish they could be entirely abolished.

Dr. Pool's paper was so thorough that it leaves nothing to be said on the subject. He spoke of pulmonary embolism. To me that is the most terrible of all postoperative complications. It comes on when you think the patient is thoroughly convalescent and about to go home, and suddenly out of a clear sky comes this fearful complication which usually ends fatally.

Dr. Pool mentioned the Trendelenburg operation which was proposed by Trendelenburg over twenty years ago and was practiced on cadavers and on animals, but never successfully carried out on a human being until 1924. Two years ago at the German Surgical Congress, Kirschner reported the first successful case of pulmonary embolectomy. Following that there have been three successful cases reported in the Scandinavian literature, and those cases when you read them are most thrilling. They are certainly genuine cases, and it is certainly a marvelous tour de force to be able to extract an embolus from the pulmonary artery and restore the patient to life, and yet I can't help feeling it is a very, very dangerous thing for the ordinary surgeon to undertake.

As you may know, in the Mayo Clinic they are using as a precaution against pulmonary embolism the administration of thyroid extract, and at the Massachusetts General Hospital, at Dr. Arthur Allen's suggestion, we are trying it on one service, giving every laparotomy case thyroid extract after operation; and on the other service they are not, with a view of getting some data as to whether this may be of value in preventing that very severe complication.

It is a great pleasure, I am sure, to see Dr. Pool in Boston and to listen to his paper. (Applause.)

Dr. Samuel W. Goddard, F.A.C.S., Brockton: *Mr. Chairman, Ladies and Gentlemen*—I am hardly prepared to add anything of information to these interesting papers, the most practical

and useful type we have had for a long time. I certainly have listened with a great deal of interest.

I was particularly interested in Dr. Mason's paper along the lines of co-öperation with the medical man, perhaps because I was brought up at a time when this sort of thing was coming into vogue and partly because of necessity I did not have the advantage of going into general practice and had to rely upon this group practice method to make adequate diagnoses. In fact, I formed a group and I feel that it has worked out very satisfactorily. Of course, there are drawbacks to this sort of practice that are well known, but I think we can combat most of them now. One has to be careful to get in the type of man who is going to co-öperate and sacrifice a little bit for the good of the whole.

I think another matter that is of great importance is our relationship to the general practitioner who perhaps seems to be losing his rightful standing in the estimation of some, although I don't think he is. More thorough histories are very desirable in making a diagnosis, and I think too in a clinic we are very apt to sit down and get our own histories and forget that the physician in general practice has seen this particular case in an acute attack, because so many of our surgical cases have had repeated attacks, and the man who has seen the case in an attack is oftentimes much more intelligent in the matter of diagnosis than those of us perhaps who have missed reference to it in our history and the patient has forgotten to tell us about it.

Then, again, an important step forward has been made by the edict of the college, providing in our hospitals a room where men in general practice can gather and have facilities for diagnosis including the laboratory and x-ray and consultations for their own cases.

In regard to the type of anesthesia, I agree with Dr. Brewster that we have heard one of the best men in this section of the country. I do believe that the situation should be guided a good deal by the particular surgeon in what he can personally do and what he is used to, together with, of course, the patient's condition and the adaptability of the particular type of anesthesia.

In regard to postoperative complications, they are our greatest bugbear, of course. While I agree with Dr. Davis that postoperative embolus is perhaps one of the most exasperating types of complications, I think postoperative ileus is one which we see oftener and is almost equally distressing. I believe that we should get at these cases just as early as possible. Of course, every abdominal case that is operated on has what might be termed a physiological ileus for a day or two anyhow. The bowels are more or less paralyzed from the combined anesthesia and the handling of organs during the operation, but there comes a time when we are not quite sure whether it is the normal type of sluggishness of the bowels or whether there is some definite pathological cause. I think it is at this time that we want to act pretty quickly and err perhaps on the side of doing a high jejunostomy rather than waiting too long.

I believe much could be done in the way of prevention if we will prepare our patients better, if we will foresee and forestall as far as possible the tendencies of the patients to particular types of complications and ward them off by preparatory treatment, the proper choice of anesthesia and in securing the best postoperative care. (Applause.)

CHAIRMAN TRUESDALE: So far, there has been just one medical man who talked on this subject. I am going to call on another, Dr. Joseph Pratt.

DR. JOSEPH H. PRATT, Boston: The importance of greater co-öperation between physician and surgeon should be emphasized. The value of joint study may be illustrated by two conditions: First, operations on patients with organic heart disease; second, operations on psychoneuroties.

The advisability of operating on a patient with organic heart disease is a question that the physician should help the surgeon to answer. In my experience the surgeon is generally too loath to operate. Some of you remember that Sir James Mackenzie spoke before this society many years ago on the effect of chloroform on the heart. In the absence of advanced cardiac weakness, he believed, heart disease is no contraindication to an operation, and this is my opinion. The physician rather than the surgeon should bear the major share of responsibility in advising an operation on the patient with heart disease.

Even when patients have severe cardiac weakness, operations may be well borne. About twenty-two years ago a patient of mine with a bad heart developed a cancer of the breast. She had auricular fibrillation with tachycardia. Symptoms and signs of chronic passive congestion of the lungs and kidney were frequently present. In those days we did not have potent digitalis and we did not know that active digitalis in the proper dosage would almost invariably slow the pulse in auricular fibrillation. Despite her poor condition, the removal of the cancer was advised. When placed on the operating table she was cyanotic and the radial pulse was weak and rapid. The Halsted operation for cancer of the breast was performed by Dr. F. T. Murphy. At the end of the operation the pulse was slower and of better quality than at the beginning. She had a normal convalescence and her cardiac symptoms were not increased during her stay in the hospital. She lived six years thereafter with no recurrence of the cancer.

The cause of death from so-called heart fail-

ure during or following operations is not clear. In many cases it is probably a circulatory failure with the heart only secondarily involved. There is no evidence, so far as I know, that this form of cardiac death is more frequent in organic heart disease than it is in patients with apparently normal hearts.

If surgeons operate too reluctantly on patients with organic heart disease, they certainly are not open to the same criticism when dealing with psychoneuroties. The symptoms presented by these patients often simulate acute and chronic inflammatory disease of the abdomen. In these cases the medical man, if he knows something of the somatic manifestations of functional nervous disease, can be of real help to his surgical colleague. An accurate account of all the symptoms of the present illness together with a good past history will often lead to the recognition of a psychoneurosis and prevent a needless operation. Recently in the medical clinic at the Boston Dispensary I saw a young woman of twenty-three with hysteria who has had the following five operations performed during the past six years: (1) Appendectomy for supposed acute appendicitis; (2) One ovary and Fallopian tube removed; (3) Gall bladder removed; (4) Spines of two vertebrae fused together; (5) One kidney removed for supposed tuberculosis. These operations were performed at five different hospitals. Six years ago, after an emergency operation for what was thought to be acute appendicitis but which revealed a normal appendix, the case was carefully studied at the Massachusetts General Hospital by a neurologist and the correct diagnosis of hysteria was then made. If the account of the findings at the Massachusetts General Hospital had been included in the histories taken at the four hospitals she subsequently entered, four unnecessary operations might possibly have been avoided. In none of these hospitals was the case recognized as hysteria.

Pain and tenderness of psychic origin in the right iliac fossa are usually mistaken for "chronic appendicitis." The evidence is not convincing that there is any such clinical entity as chronic appendicitis. With few exceptions, the patients I have studied whose history revealed an operation for "chronic appendicitis" were suffering from a psychoneurosis when they later came under my observation. This vexed problem of the cause and mechanism of chronic pain and tenderness in the right lower quadrant of the abdomen is one of many that can be most readily solved if the physician and the surgeon work together in their clinical and pathological study.

Dr. Richard O'Neil, F.A.C.S., Boston: *Mr. President, Ladies and Gentlemen*—I did not have the opportunity of hearing all these papers. I would like to say a word on preparation of patients from the urological point of view, and I think the general surgeon has taken a good many leaves from our notebook in this connection.

When I was a young man, the ordinary renal preparation was very scanty. A routine examination of the urine was made by one of the younger junior men, and that is about all there was to it. There was no record of intake or output of fluids.

Now it is the custom in every recognized hospital to have the urine carefully charted before operation, and after operation. The retained nitrogen estimation, and the renal function are done as a routine matter. If any of these are far from normal, a course of routine renal preparation is instituted by forcing fluids, administration of digitalis and the patient made suitable for operation.

I am firmly convinced in the past many of the cases of so-called stormy convalescence or even fatalities which were put down to ether anesthesia have really been due to uremia. Patients no longer come to the operating table desiccated, with a dry tongue, but fluids are administered up to the last minute, and freely administered after operation. I think the contribution has come directly from the urologists who learned it in the treatment of prostatic obstruction.

In regard to anesthesia, we employ now as a routine for prostatectomy spinal anesthesia. We find it with the newer solutions, with the employment of ephedrin, a safe and steady anesthesia and the best for those patients. With the Pitkin solution, we are able to put them in the Trendelenburg position if we want to, and we can administer fluids even during operation, if necessary. (Applause.)

Dr. H. M. Clute, F.A.C.S., Boston: *Mr. Chairman*, the postoperative complications following abdominal operations which try the surgeon most frequently, it seems to me, are, first, unexplained fever and, second vomiting.

Postoperative fever after a laparotomy, in our experience, should be searched for in one of three places. Ninety-nine times out of one hundred it is in the wound. If you operate on a patient and trouble comes afterwards, almost always the cause is in the operative wound. But if you can satisfy yourself by examination or better by probing that the infection is not in the wound, then we feel the next thing to do is a rectal examination, because collections of pus commonly occur in the pouch of Douglas after something goes wrong in the laparotomy. If the wound is negative and if the pouch of Douglas shows no evidence of infection, then one should immediately take an x-ray picture of the diaphragm to determine the possibility of a subphrenic abscess. Subphrenic abscess will be suspected by the high fixed diaphragm of which Dr. Pool spoke which is shown by fluoroscopy does not move at all in relation to the diaphragm on the other side.

When, in addition to the high fixed diaphragm and the fever, one can find some further evidence of infection such as edema of the skin, deep tenderness on fist percussion over the liver and a low liver border one then should go so far as to needle the patient in the subphrenic space. We now insert a needle to tap for subphrenic pus, just as readily as we use a needle to tap for pus in the pleural cavity.

Postoperative vomiting is one of the very difficult surgical problems and there are two points that I would like to speak of from our experience in treating these cases. One of the first things that we like to do in postoperative vomiting is to take some sterile instruments, put a little iodin on the wound and put a probe in the wound between the skin sutures. If the probe slips away from you or if you can wobble it all around in the wound without engaging in the deep fascia, then you may feel certain that there is a rupture of the wound, even though there has been no discharge of serum and no protrusion of omentum. The patient will frequently state that something broke in the wound during one vomiting spasm. This history is very significant and should receive careful attention. Resuture of the wound under regional anesthesia and with through and through sutures must be undertaken at once.

The second point I wish to discuss in considering postoperative vomiting is the surgeon's own psychology. One of the most difficult things for the surgeon to do is to go back to a patient and his family and say, "I am sorry, but we have to operate on you again." Yet we all know that when simple measures fail, a jejunostomy is often life saving in postoperative vomiting.

We dislike to put the patient through a second operation within forty-eight or seventy-two hours of his first operation. I am convinced, however, that if we can handle our own psychology and bring ourselves to advise an enterostomy a little earlier, instead of waiting until it is very late in the course of the case, then our recoveries from postoperative vomiting will be much more numerous.

I am certain that Dr. Pool's paper has been most instructive to all of the surgeons, and we have had an excellent and enjoyable afternoon. (Applause.)

CHAIRMAN TRUESDALE: I am sure that the urological opinion can't be overdone in its relationship to this subject.

I am going to call on Dr. Merritt.

DR. EDWARD L. MERRITT, Fall River, Mass: *Gentlemen*, I appreciate your Chairman calling on me at this time to discuss these very excellent papers, and I feel certain that every one here has profited immensely by them. I was extremely interested in Dr. Mason's paper regarding the need of closer co-öperation between the physician and the surgeon and I feel certain that it is very, very essential. There is no questioning the fact that the group with which Dr. Mason is associated has proven this co-öperation to be of value. It is, of course, carried out in the vast majority of hospitals in much the same way, but perhaps not quite so closely.

Dr. Sise's paper on anesthesia was also exceedingly interesting, especially from the urological standpoint. Most of us are using spinal anesthesia today in prostatic surgery and it is, of course, very, very beneficial. It was a most excellent paper, and Dr. Sise is to be congratulated for his fine work.

Dr. Pool's paper on postoperative complications was also extremely interesting, clearly presented, and very helpful. I must admit that I have had my share of postoperative complications and I have learned a great deal from his excellent presentation. Thank you all very much. (Applause.)

CHAIRMAN TRUESDALE: *Gentlemen*, we might have the honor of hearing from the President of the Society on this subject. He has had a lot of experience and perhaps he has had postoperative complications. (Applause.)

PRESIDENT BIRNIE, F.A.C.S.: Thank you, gentlemen.

I am very sorry that I wasn't able to hear these papers. We have had such a long and protracted meeting of the Council. We have just finished.

I was very much interested in the program and wanted to hear these papers. All of us who do surgery over any period of time are bound to have postoperative complications. I have just had one in my own experience that was new to me, although I have read of such cases many times, and that is massive collapse of the lung. I have heard a good deal about it, but never happened to run into it until this last week. We had a man brought into the hospital with a ruptured gastric ulcer. He did perfectly well, considering, for the first two days, and then he got an awful bump as he had a massive collapse of the entire right lung. I am glad to say that he is progressing, and I feel that he is going to come through.

When you practice surgery for a good many years—I have practiced more years than I possibly look—and then run into a massive collapse of the lung, it sort of jars you.

One other thing in regard to Dr. Clute's discussion, I wondered if he really meant to convey the opinion which he conveyed to me, that given a patient vomiting twenty-four hours after operation one should seriously consider going into his abdomen a second time. It seems to me that is a wee bit early and a wee bit drastic.

I was brought up quite a number of years ago under the supervision of Dr. Deaver who was, and still is, extremely strong for the stomach tube, washing out the stomach. I have always followed that through and I still have a great

deal of faith in what Dr. Deaver speaks of as the yard of rubber. (Applause.)

CHAIRMAN TRUESDALE: The subject is open for discussion. Is there somebody else who would like to speak? We have time. There were only three papers placed upon the program so that we might have ample time for a general discussion. It has been very valuable so far, very interesting, very engaging. Would somebody else like to share in the discussion? If not, we call upon the readers to close the discussion. Dr. Mason says he has nothing to say. Dr. Sise!

DR. LINCOLN F. SISE: There are a great many factors, of course, in the choice of anesthetic besides the ones I mentioned, and we have to consider them all. Anesthesia is making progress along with all the rest of medicine, and new methods, new refinements, new substances, are being added all the time; and we more and more can fit and pattern our anesthesia to fit our patient, rather than make it a matter of routine and habit, as perhaps we have sometimes done in the past. (Applause.)

CHAIRMAN TRUESDALE: I would like to say a word in praise of the efficient service of the Secretary. It is not an easy task to arrange a program for a section of this sort, as so many of the subjects have had liberal attention at various meetings of surgeons. I believe that Dr. McKittrick has focussed attention upon a very important subject and therefore much credit, in fact all the credit, is due him for the success of the meeting this afternoon.

We will adjourn the meeting.

The meeting adjourned at four forty-five o'clock.

The following officers were elected to serve for the ensuing year in the Section of Surgery:

Chairman—Dr. Irving J. Walker, Boston.
Secretary—Dr. Leland S. McKittrick, Boston.

THE CYSTIC ARTERY IN CHOLECYSTECTOMY

BY FRANK H. LAHEY, M.D., F.A.C.S.*

ONE of the most important steps in the removal of the gall-bladder from below upward or from above downward is the careful dissection of the cystic duct in order that it may be exposed thoroughly throughout its entire extent. It is necessary that the duct be dissected completely and carefully exposed in order that one may be certain that a small stone has not been left in the stump of the cystic duct distal to the tie, and in order to be sure that the cystic duct has not been ligated so close to the common duct that the tie encroaches upon the lumen of the common duct, narrowing that structure and eventually producing a stricture of the main bile channel.

Anyone who has dealt with cholecystectomies in any considerable number has realized how easily a small stone may be overlooked in the lower end of the cystic duct; how often the duct has been ligated proximal to the stone and the common duct; and how easily the remaining stone may make its way into the common duct to later cause distress and possible duct obstruction.

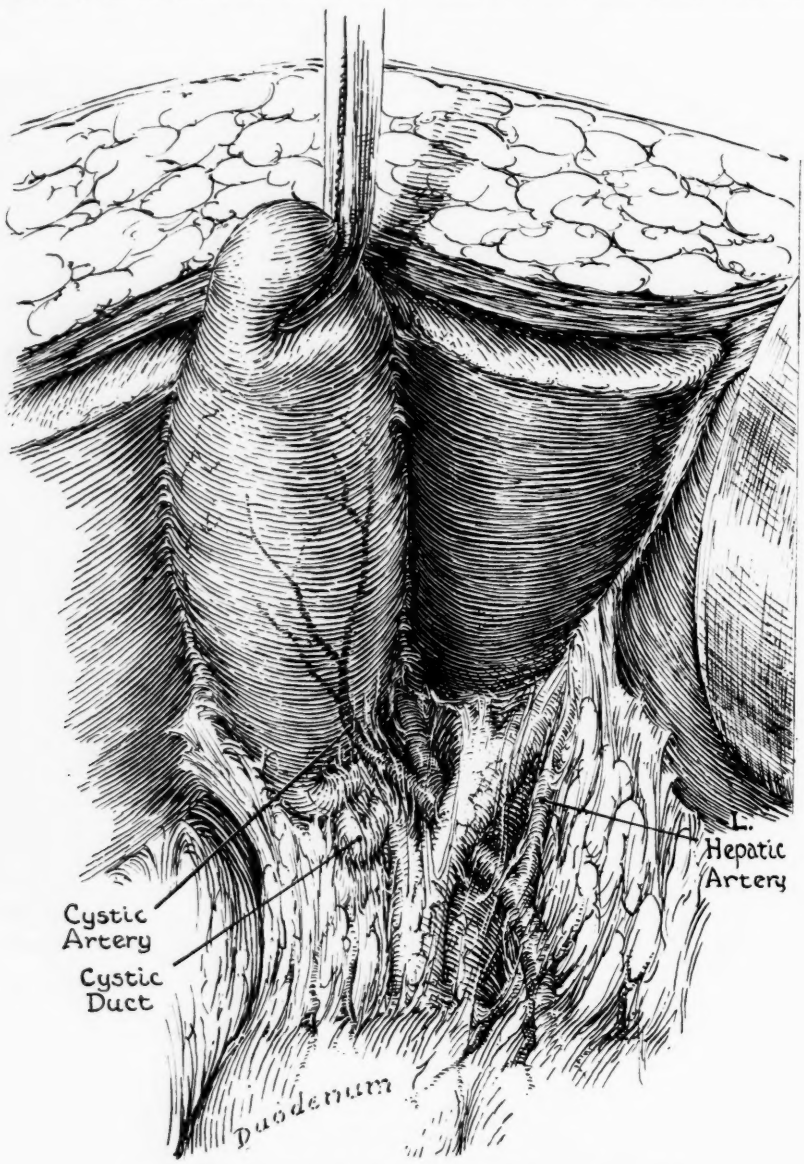

ILLUSTRATION NO. I. Showing the relation of the cystic artery to the cystic duct. Note the reduplication which frequently occurs in the cystic duct. Note also how traction on the gall-bladder would immediately be transmitted through the cystic artery.

*For record and address of author see "This Week's Issue," page 542.

In previous writings upon biliary tract disease and in discussing the management of twelve patients with stricture of the common or hepatic ducts, I have stressed that the most common cause of stricture of the main bile ducts is operative trauma at two points, one, in the hepatic duct where the cystic artery crosses at its origin from the hepatic artery, and, two at the point where the cystic duct joins the common duct. The strictures of the hepatic duct due to operative trauma with which we have had to deal have come to us with operative histories showing technical difficulties with the cystic artery, resulting in hemorrhage and possible indiscriminate clamping about the region of the junction of the cystic and hepatic arteries. In the same way the strictures of the common duct at the point where the cystic duct joins that structure were doubtless due to upward traction upon the cystic duct, apexing of the common and hepatic duct, the placing of the ligature too low, and inclusion of part of the wall of the common duct, resulting in narrowing and eventual stricture of that structure.

It is with the purpose of making possible adequate mobilization and demonstration of the junction of the cystic, common and hepatic ducts that the suggestion is made that invariable and individual ligation of the cystic artery be performed in all cases of cholecystectomy. The usual course of the cystic artery from its origin at the hepatic artery across the hepatic duct and along the upper side of the cystic duct serves, in a measure, not only to obscure the angle between the cystic and hepatic ducts, but, due to the fact that it is usually much shorter in length (see Illustration I), exposure of the angle where the cystic and hepatic ducts join, is limited since upward traction on the cystic duct brings all of the strain of traction upon the

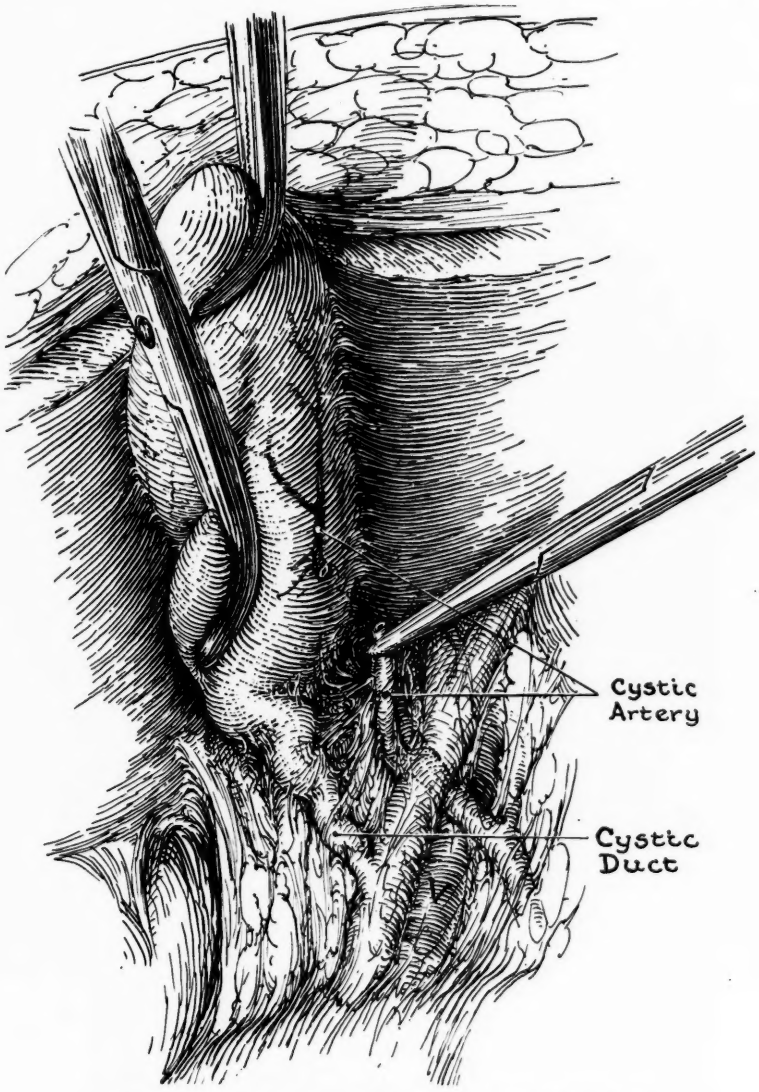

ILLUSTRATION NO. II. Showing cystic artery clamped and cut. Note how the folds in the cystic duct may now be straightened out at the junction of the cystic, common and hepatic ducts when the cystic artery is cut.

shorter artery rather than upon the duct. There is a further disadvantage in this respect, in that vigorous upward traction, particularly in cholecystectomy for acute and subacute cholecystitis, causes tearing of the cystic artery. Grasping both the cystic artery and cystic duct in the bite of a single clamp occasionally causes rupture of the taut cystic artery.

It is, therefore, urged as advice to those who have not as yet struggled with cystic arteries torn off close to their origin, that the cystic artery be carefully separated from the cystic duct and ligated individually. To those who have not customarily practiced this procedure, it will be surprising to see how readily the hepatic and common ducts may now be brought up into the field and how plainly the angle between the hepatic and cystic ducts may be demonstrated. (Illustration II.) This makes possible the ready demonstration of a possible small stone at the junction of the cystic and hepatic and common ducts; at the same time it prevents injury to the hepatic artery, and permits accurate clamping of the cystic duct at the proper distance from the common and hepatic ducts.

These procedures are submitted with no suggestion of originality, but as proven, added, technical factors of safety.

SOME FACTS ABOUT BLINDNESS

"Leaders among organized labor can do much to reduce blindness and conserve vision generally, not only among workmen and working women, but among their families at home", according to a statement by Lewis H. Carris, of New York City, managing director of the National Society for the Prevention of Blindness, read before the Arizona State Federation of Labor here today. Labor leaders can do this, Mr. Carris said "by emphasizing at every opportunity the fact that nearly all blindness is easily preventable, that sight once lost can never be restored, and that no financial award can really compensate for the loss of vision."

This address by Mr. Carris is part of the nation-wide educational campaign recently undertaken jointly by the American Federation of Labor and the National Society for the Prevention of Blindness in an effort to conserve the sight of working men and women.

The National Society for the Prevention of Blindness has found that there is no such thing as a "non-hazardous occupation," Mr. Carris said. "Just as any group of citizens, working men and women are subject to all the accident hazards in the home, at play, or in the street. In addition to these, the working man and working woman are confronted with the further dangers of losing their sight which are to be found in the shop, factory, or in the office, store or stockroom, in fact, in any place where people are at work.

"Of the 100,000 blind persons in the United States, it is estimated about 15,000 lost their sight in occupational pursuits. In addition to the totally blind, there is a much larger number of men, women and children whose vision has been so impaired by the eye hazards of industrial occupations that they are handicapped throughout life. Although most industrial eye strain, industrial eye disease, and eye accidents are avoidable, thousands of men and women become wholly or partially blind because of their occupational life each year.

"The industries of the country are now paying approximately $10,000,000 a year as compensation to workmen who have been totally or partially blinded while at work. This is a direct loss. The indirect loss from this same cause is conservatively estimated as four times that figure. This annual expense of $50,000,000 is inevitably reflected in the cost of commodities and services and thereby in the cost of living.

"There is a further direct loss to the working men and women of America through lowered efficiency or earning capacity following blindness or serious impairment of vision which is probably much more than $10,000,000 a year. The more serious, though less tangible, loss is the tragedy that enters every home in which a person has been blinded or has lost part of his sight permanently. The cost of these tragedies which often spells disaster—cannot be estimated in terms of dollars.

"Following a destructive eye injury, the workman is often confronted with the problem of learning a new trade; sometimes he can remain in the same trade with lowered efficiency and consequently lowered earning capacity. Moreover, in no state do present compensation laws guarantee the blinded workman a living wage for the rest of his life. And there are few jobs for blind men or near-blind men on which a family can be supported decently. In New York State, for instance, the law sets a maximum of $20 a week for partial disability and $25 a week for total disability which is to be paid over a period of 160 weeks; after this length of time it is assumed that the injured man has learned a new trade and becomes self-supporting; but in many cases the blinded workman finds himself so incapacitated that he can never again be the bread winner for his family."

THE NEW HAMPSHIRE SURGICAL CLUB

UTERINE BLEEDING; AN ANALYSIS OF CASES SEEN IN THE TUMOR CLINIC OF THE MASSACHUSETTS GENERAL HOSPITAL*

BY JOE VINCENT MEIGS, M.D., F.A.C.S.†

INTRODUCTION

AN analysis has been made of 243 patients who were referred to the Tumor Clinic of the Massachusetts General Hospital from 1925 to 1929 complaining of uterine bleeding or uterine bleeding and vaginal discharge. Many of the patients were sent to the Clinic because they had cancer and many others were sent for unexplained bleeding, in both young and old. This is not a cross-section of patients referred to the hospital for treatment of these conditions, but of cases referred to a Clinic dealing primarily in patients with malignant disease. Many of the cases of benign bleeding and of malignant disease of the female genital tract were seen in the hospital but are not included in this series unless they were eventually referred to the Tumor Clinic.

No attempt has been made to divide the cases into those having menorrhagia, which indicates an increased amount of bleeding at the time of the menstrual period, or into metrorrhagia which ordinarily means bleeding between periods. All patients followed had abnormal bleeding of some kind. Inasmuch as most of the patients that were curetted who did not have malignant disease showed on pathologic examination hypertrophy or hyperplasia of the endometrium, this pathological finding has been disregarded in this report. Some of the patients probably bled because they had hypertrophy or hyperplasia, but it is assumed in this study that most of them had the hypertrophy or hyperplasia because they were bleeding. A separate study will be made eventually of this particular phase of the cases of uterine bleeding.

A few general statistics are of interest. Of the 243 patients, 84, or 34% had malignant disease; 78 patients had passed the menopause and of these 40% had cancer of the cervix and 21% adenocarcinoma of the fundus of the uterus. It has always been considered in the Tumor Clinic that most patients with bleeding following the menopause had carcinoma of the fundus of the uterus, but as these statistics show, only a moderate percentage of them have this disease. Of the 66 cases designated uterine bleeding without pathology, 28 were 50 years of age or older and most of these had passed the menopause. There were 4 cases of multiple tumors, 2 with carcinoma of the cervix and breast, 1 with carcinoma of the cervix and rectum and 1 with uterine fibroid and fibrosarcoma of the breast. An analysis of the individual groups follows. Malignant tumors will be discussed first.

Cancer of the Cervix. There were 61 cases of cancer of the cervix, 25% of the total number of cases of uterine bleeding. In the groups 1 A and 1 B, as designated by the American College of Surgeons' classification, there were 20% of the total number of cervix cases, while 80% fell in the unfavorable groups, 1 C and 1 D. A large majority of all cases were in Class 1 C with involvement of the cervix, vagina and some fixation in the broad ligament region. There were 5 cases not treated that were so far advanced that x-ray or radium seemed out of the question. 61% of all cases were between 40 and 60 years of age. At the end of four years in this Clinic, which is too short a time for complete analysis of the results, 27% of the treated cases are alive and well without evidence of disease; 17% are dead and 56% are dying or living with disease. There are a few cases of sufficient interest to report individually. Case No. 868, age 68, had had a procidentia and worn a pessary for a support for a considerable period of time. She developed epidermoid carcinoma of the cervix. This is quite unusual for it has always been noticed that although the cervix in procidentia receives a great deal of trauma and chronic irritation the incidence of cancer is very low. Case No. 564, age 44, noticed bleeding following intercourse. She was referred into the hospital from the Tumor Clinic with a diagnosis of probable cancer of the cervix. In December, 1925, a bilateral repair of the cervix and curettment were done and the pathologic report showed no evidence of malignancy. She was followed in the Out-Patient Department where the cervix was always noted as being hard. Her bleeding stopped until she reported again to the Tumor Clinic in August, 1928, with the same symptoms. She was again referred to the hospital and a total hysterectomy was done and the pathologic report showed a small area of carcinoma in the cervix. This was not discovered before operation even with the patient under ether and exploration of the cervix. Case No. 1340, age 58, was operated upon in the hospital in July, 1927. Her cervix was repaired and the uterus suspended. No suspicion of carcinoma of the cervix was noted at the time of repair.

*Read before the thirty-first semi-annual meeting of the New Hampshire Surgical Club at Concord, N. H., May 1, 1929.

†For record and address of author see "This Week's Issue," page 542.

The pathologic report showed squamous cell carcinoma and she was given radium treatment.

The last two cases show the difficulty sometimes encountered in making a diagnosis of carcinoma of the cervix. Nearly all cases of cancer of the cervix can be diagnosed when first seen but occasionally an unexpected report of carcinoma is returned from the laboratory when the diagnosis is not suspected. On account of these two cases and others not reported in this group of a similar nature, and because of the frequency of carcinoma in the retained cervical stump, it is suggested that in any patient where there is a bad laceration of the cervix with any suggestion of abnormal bleeding or abnormal discharge, a repair of the cervix should be done and the tissue examined in the laboratory before the patient is subjected to a supravaginal hysterectomy for her bleeding, because the treatment of carcinoma of the retained cervical stump is more difficult and less effective. Total hysterectomy in suspicious cervix cases is not advocated because the operation is serious and carries a greater mortality and morbidity than supravaginal hysterectomy, even in the hands of the most expert. It is far better to subject the patient to two operations in these suspicious cases than to run the risk of doing irreparable harm to the patient.

Carcinoma of the Retained Cervical Stump. Two cases of carcinoma of the retained stump of the cervix following supravaginal hysterectomy reported to the Tumor Clinic. Both cases were treated with radium and both are alive and well two years following their treatment. In the various Cancer Clinics the incidence of carcinoma of this type is much too great and it leads to the suspicion that patients with bleeding and discharge are subjected to supravaginal hysterectomy without careful investigation of the cervix. Some of them undoubtedly have cancer at the time of the hysterectomy and some of them probably develop it some years following the removal of the uterus. However, because of a few tumors that probably have been overlooked at the time of operation, a repair of the cervix and the careful examination of the specimens is advocated before supravaginal hysterectomy is undertaken.

Adenocarcinoma of the Fundus of the Uterus. 17 cases of adenocarcinoma of the fundus of the uterus came to the Tumor Clinic. This number is 7% of the total cases of uterine bleeding and 21% of those cases with bleeding following the menopause. Various types of treatment were instituted. Before analyzing them it must be stated that this number is only a small percentage of the patients operated upon in the hospital for this disease, as many of them never reported to the Tumor Clinic. There were 3 total hysterectomies, all of them alive and well, 1 vaginal hysterectomy, alive and well, and 10 cases were given radium in the uterine canal. Two of the latter are alive, four are dead, two dying and two are lost. The radium was given for very definite reasons; four of the patients had metastatic nodules in the vagina plus the cancer of the fundus, two of them had severe diabetes, two of them were very old and in poor condition and operation was advised against by surgical consultants, and two of them were given radium treatment following a diagnostic curettage and operation advised later, but both were lost. In patients with bleeding following the menopause or with abnormal uterine bleeding at almost any age, diagnostic curettage is of the utmost importance as will be shown in the following 3 cases. There were 3 cases of supravaginal hysterectomy, in whom either a diagnostic curettage was not done or in whom a diagnosis was not made at the time of operation. Of these 3 cases one recurred in the cervical stump 6 months following hysterectomy, one recurred 6 years following hysterectomy in the cervical stump and one recurred in the vagina 1 year later. These patients are not doing well. Supravaginal hysterectomy might suffice for some cases according to the position of the tumor, as will be shown in the lantern slides, but it is impossible to tell at the time of operation the exact location of the tumor. Frequently this type of growth grows down to the internal os and sometimes through it, showing that supravaginal hysterectomy, or supravaginal hysterectomy with coning out the cervix should not be considered as a method of treatment. Metastatic growths in the ovary are not uncommon, 2 of the cases in this series having metastases in the ovary. In a study of 206 cases of adenocarcinoma of the fundus at the Huntington Memorial Hospital over 12% showed a metastatic growth in the vagina. In this series of cases 17 or 23% had vaginal metastases. Therefore, careful exploration of the vagina under ether must be done before hysterectomy, and because the metastasis sometimes occurs late, careful inspection of the vagina at regular intervals following operation for this tumor is advised. Radium is not recommended except in those cases where there is a definite reason to avoid an operation of the severity of total hysterectomy. Occasionally the results with radium are good but will not give a 60% favorable report at the end of five years, as total hysterectomy has done. In adenocarcinoma of the fundus of the uterus, or in those patients suspected of it, exploration of the vagina and cervix and careful curettage with frozen section diagnosis is of the utmost importance. By this method many patients will not be operated upon and others will be saved the partial operation of supravaginal hysterectomy. Total hysterectomy with removal of both adnexae is the operation of choice.

Leiomyosarcoma, or Malignant Fibroid. Three cases reported to the Tumor Clinic. Two of these patients had had a supravaginal hysterec-

tomy for what were supposed to be fibroids—the pathologic report, however, showed leiomyosarcoma. One of these patients is dead, the other dying. One case demonstrated very well the efficacy of x-ray treatment in certain types of tumors. This patient, No. 42, was operated upon in July, 1925, and later examination showed a large mass in the pelvis. X-ray treatment was started and after two weeks she reported to the Emergency Ward with a high temperature and a large fluctuant mass in the pelvis. This was opened under ether and about a quart of broken-down tumor and necrotic tissue was removed. X-ray treatment had melted the tumor very rapidly. The third case, No. 1556, had what clinically seemed to be carcinoma of the cervix. A diagnostic curettage showed squamous cell carcinoma. She was given a radium treatment in December, 1927; the radium did nothing to the lesion and it was felt that perhaps the emanation had failed on this day. Her treatment was repeated in March, 1928, with about the same result. In August, 1928, the cervix was amputated with the endothermy knife and the pathologic report at this time showed leiomyosarcoma. This accounts for the lack of reaction to the radium treatment and suggests that if no favorable reaction is obtained in response to a radium treatment in the cervix the lesion should be carefully re-examined.

Adenocarcinoma of the Ovary. One case of adenocarcinoma of the ovary had uterine bleeding. Case No. 1342, age 68, had been flowing for two months. She had had the menopause 20 years before. Supravaginal hysterectomy, removing both tubes and ovaries, was done in June, 1927. She had hemorrhagic cysts in both ovaries and adenocarcinoma of one ovary, but no sign of malignant disease of the endometrium. In February, 1928, a hard lump was noticed under the skin at the right costal border. This was excised and showed metastatic, highly malignant carcinoma; apparently a case of metastatic growth in the abdominal wall from cancer of the ovary.

This concludes the cases of malignant diseases seen in the Tumor Clinic. An analysis of the benign cases follows.

Leiomyoma or Fibroids. There were 24 cases of fibroids in the Tumor Clinic, 9% of the total number. The treatment of these patients varied considerably. There were 10 supravaginal hysterectomies with one death; 8 patients had a diagnostic curettage and x-ray treatment, 3 patients had x-ray treatment without curettage; (a diagnostic curettage was not done in these cases because, on account of severe diabetes or hypertension, it was felt it was better to avoid an operation if possible) myomectomy was done in 3 cases and in one the uterine bleeding has continued. It will be noted that all of these patients, except three, were curetted. Ether examination and curettage were done because it was felt that a diagnosis of adenocarcinoma of the fundus of the uterus could not be ruled out without pathologic examination and because of the necessity of careful inspection of the cervix and removal of specimens where necessary. 65% of these patients were between the ages of 40 and 55 and 8% of them were beginning the menopause. Leiomyoma is supposed not to cause bleeding after the menopause but in this series a few patients had bleeding due to fibroids after the menopause. Contraindications for x-ray treatment of fibroids were disregarded in one patient who had a large pedunculated tumor and severe diabetes with an enormous amount of bleeding. Pedunculated fibroids usually mean that radium or x-ray treatment is unsafe but in this case x-ray treatment was perfectly successful and the patient has had no untoward symptoms. Shrinkage of the tumor was noticed in most patients treated by x-ray at the end of six months and no further shrinkage was noted after a year had passed. This small series seen in the Tumor Clinic is not a cross-section of the treatment of fibroids in the hospital, for most of them, unless there is reason to the contrary, are subjected to supravaginal hysterectomy.

Ovarian Cysts. There were 9 patients with uterine bleeding who had ovarian cysts. In four of these patients removal of the ovarian cyst corrected the bleeding; in three of them the bleeding did not stop, radium being necessary in one case to control it, and in the two other cases the periods were regular but very profuse; in two other patients where both tubes and ovaries were removed and where complete amenorrhea should have followed, the patients had regular small periods every month. In these two latter patients some ovarian tissue must have been left behind. Ovarectomy was not successful in checking the abnormal bleeding in all cases and it is probable that the ovarian cyst was not the cause of bleeding in some of these patients.

Endometriosis, Adenomyoma or Chocolate Cysts. Five cases of endometriosis with uterine bleeding reported to the Tumor Clinic. In four of these patients a supravaginal hysterectomy was done with removal of both adnexae; in one of them there were endometriomata in both ovaries, the recto-vaginal septum and the sigmoid; in another the uterus contained diffuse adenomyoma and there were endometriomata in both ovaries; in another adenomyoma was found in the recto-vaginal septum and in this patient hysterectomy with removal of both tubes and ovaries was done to cause cessation of growth and atrophy of the recto-vaginal septum tumor. This it has definitely accomplished. The fifth patient had had a tube and ovary removed previous to entrance to the hospital. Uterine bleeding had continued and suspension was done. Then, as the bleeding continued, the uterus and remaining tube and ovary were re-

moved. These showed endometrioma in the uterus and in the ovary. She later had a nodule of adenomyoma occur in the abdominal wall and even though both ovaries and uterus were thought to have been removed the bleeding continued. X-ray treatment was then instituted and she is at last having symptoms of the change of life without bleeding and atrophy of her lesion in the scar will probably follow.

Cervical Polyps. There were 10 patients with polyps of the cervix, two of them occurring following supravaginal hysterectomy. Removal of the polyps usually sufficed to check the bleeding. In one case radium was resorted to and in another amputation of the cervix.

Endometrial Polyps. In 2 patients polyps of the endometrium were held responsible for the bleeding. In one of these supravaginal hysterectomy was done and two polyps were found in the endometrial cavity; in the other diagnostic curettage revealed a polyp and x-ray treatment was advised.

Lacerated Cervix. There were 6 cases in which laceration of the cervix was thought to be responsible for the bleeding. In these patients the cervix was repaired.

Vaginal Erosion. Two patients showed erosion of the vagina, one having had an amputation of the cervix. In both instances heavily screened radium treatment caused cessation of the bleeding.

Bleeding from the Cervical Stump. In one patient there was bleeding from the cervical stump following supravaginal hysterectomy. A careful curettage revealed no pathology. She was given a radium treatment and the bleeding ceased.

Senile Vaginitis. In 3 patients a red, delicate, easily bleeding vagina was felt to be responsible for the symptoms. In one there were marked adhesions in the vagina and a foul discharge. Careful vaginal exploration and exploration of the cervix and uterus revealed no other pathology than the atrophied vagina. In two patients heavily screened radium treatment controlled the bleeding and caused nearly complete obliteration of the vagina. In the third, exploration and curettage sufficed.

Incomplete Miscarriage. There were 5 cases of bleeding due to retained products of conception. Curettage and removal of the retained tissue caused the cessation of the bleeding.

Pelvic Inflammation. There were 12 cases of pelvic inflammation, or salpingitis, which it was felt caused the uterine bleeding. These were 4% of the total number of cases. In 5 patients hot douches and rest in bed quieted the acute inflammation and the bleeding was controlled. In four it was necessary to remove the uterus, both tubes and ovaries; in one patient one tube and ovary, and in 2 others a bilateral salpingectomy was done. Nine of the cases were acute or subacute and 3 chronic. In all cases the results were favorable.

Thrombopenic Purpura Hemorrhagicum. There were 3 cases of true thrombopenic purpura. The diagnosis was confirmed in all patients by the Medical Department of the hospital. Thrombopenic purpura has long been known to be a cause of uterine bleeding and some of the severest cases of bleeding are due to this type of disease. It should always be thought of and patients with unexplained bleeding should have careful blood studies to rule out the possibility. A prolonged bleeding time, poor clot retraction and diminished number of platelets with a history of bleeding makes the diagnosis nearly certain. Case No. 229, age 34, was treated with deep x-ray over the spleen and was well at the end of 9 months, when she was lost sight of. Another case, No. 1303, age 22, had occasional bleeding even though she had been given three intra-uterine radium treatments. A third case, No. 1370, age 36, had severe bleeding for which she was given x-ray treatment following a diagnostic curettage. Three months after her x-ray treatment she showed black and blue spots for the first time and her bleeding time on one occasion was found to be 25 minutes and on another 8½. She was considered to have thrombopenic purpura but not severe enough to warrant splenectomy. In true thrombopenic purpura splenectomy is the operation of choice providing the patient's symptoms are severe enough to warrant a major surgical operation.

Atypical Purpura. There were 11 cases of "atypical purpura", 4.5% of the total number. In these patients the diagnosis was made on some abnormality in the blood or a history of easy bleeding, nosebleeds, bleeding following tooth extraction and frequent black and blue spots. In 5 patients the coagulation time was prolonged and 3 of them had increased bleeding time, in two the platelets were decreased and in one poor clot retraction was noticed. Five of them simply had a history of "easy bleeding" and black and blue spots. In three cases x-ray treatment was given over the spleen with fair results; in three a supravaginal hysterectomy was performed successfully without hemorrhage and with a perfect result for the patient; in four x-ray treatments were given over the pelvis following diagnostic curettage, three of them with excellent results and one of them has been lost track of. All of these patients fell between the ages of 20 and 40, most of them being about 30. This is a definite type of case and must always be thought of when considering the cause of bleeding from the uterus with no definite local pathology.

Menorrhagia and Metrorrhagia without Pathology. Sixty-six cases, or 27% of the total number had uterine bleeding sufficient to send them to the Clinic, and in all no definite pathology could be found to account for their bleeding except a pathologic report of hyperplasia or hypertrophy of the endometrium in those cases that were curetted. It did not seem

wise to attribute the bleeding to the pathologic endometrium for a great many of them showed microscopically what apparently could be considered menstruating endometrium. Of these 66 patients 16 had a curettage alone and in two of them the results were not successful. In 12 patients following a diagnostic curettage a radium treatment was placed in the uterine canal—one of these was not successful and had x-ray later over the pelvis which permanently checked the bleeding; 9 of them had x-ray treatment following curettage, all with success; 3 of them had curettage and suspension of the uterus and in one instance the bleeding continued; 3 of them had a supravaginal hysterectomy. Most of the above patients fall into the group of bleeding without pathology at the menopause age—38% were in this group, 21% were between 30 and 40, and 41% from 12 to 30. In this latter group a different type of treatment was outlined. Here, sometimes without doing a diagnostic curettage, gland extract treatment was instituted. Blood studies were done in some and in many instances the basal metabolic rate. Twenty-seven patients received 15 grains of corpus luteum per day by mouth and 1½ grains of thyroid extract per day and most of them Blaud's pills; 16 of them were much improved, in 6 the result was only fair and in 5 of no help. Metabolism was done on 23 patients and in 14 of them it was found to be on the low side of the average normal and sometimes definitely low. Corpus luteum and thyroid were effective in all cases where they were used when the metabolic rate was a low average normal or lower. The result would seem, therefore, to be due to the thyroid extract, but thyroid extract itself did not seem sufficient in all cases. There have been many other cases treated in the hospital and in private practice which will later constitute a group for further study. Thyroid extract is used because many patients who have hyperthyroidism have no periods or have very small periods and because one of the early symptoms of myxedema apparently is an increase in the amount of the menstrual period. Corpus luteum is used because during pregnancy the corpus luteum of the ovary is very large and active and patients who are pregnant do not menstruate except abnormally, and also because many patients with corpus luteum cysts of the ovary have amenorrhea, flow less often than normal or else have very small periods. The results in this small series would seem to bear out the fact that these two gland extracts are useful in the control of uterine bleeding in certain cases. Certain cases in this group stand out and a few individual cases will be mentioned. One patient, No. 965, age 18, was flowing regularly in large amounts for a year and a half and later she began to flow nearly continuously and had extremely severe eczema involving the face, arms, hands and legs. It was necessary to place her in the hospital and no treatment seemed of any avail. She was then given thyroid and corpus luteum and her next period seemed quite normal for the first time in years and her eczema considerably improved. With careful watching and supervision since September, 1926, her condition has markedly improved and when seen April 20, 1929 she was working, her periods were slightly smaller than normal and her eczema had practically disappeared. Another patient, No. 680, age 18, had always had pain and very marked uterine bleeding. Before entrance to the hospital she had been transfused three times. Corpus luteum and thyroid were of very little avail, occasionally seeming to help slightly. She was carried along from 1926 to July, 1928, when a huge period made it necessary to refer her to the hospital—she was having very severe headaches, her hemoglobin was 50 and red count 3,000,000. She was transfused again and 4 diseased teeth were removed. Since that time her periods have been normal and her headaches have disappeared. Another patient, No. 632, age 20, had been bleeding nearly constantly since her periods began. No medicine had done any good whatsoever. In June, 1926, a curettage was done and no definite pathology was found. Since then her periods have been much farther apart than normal and in January, 1929, she had not had a period for 3 months and it was necessary at this time to give gland extracts in the hope that her normal menstrual rhythm could be re-established. Another patient, No. 1809, age 13, started her first period in December, 1928. She had been flowing for 17 days when she was referred to the hospital. She was very much bled out and before medication could be started a transfusion was necessary. Since that time until April 15, 1929, she has been taking corpus luteum and thyroid extract. She has gained weight and without question the medicine has had some effect upon her bleeding for when she stops taking it severe bleeding begins again.

It will be seen, therefore, in this small number of patients reported in detail, the type of patient that the Tumor Clinic has attempted to handle and the method of handling them. Considerable success has been had with gland extracts. Two other patients who had had uterine bleeding are of great interest. Patient No. 116, age 43, had had severe flowing for five or six years with attacks of epilepsy coming quite frequently. It seemed wise to try to check her bleeding inasmuch as it was quite severe. Following a diagnostic curettage she was given a radium treatment in August, 1926. Since that time she has gained 26 pounds and has had no return of her attacks. Patient No. 1465, age 38, had had irregular periods with uterine bleeding for the last four years. She had attacks simulating epilepsy since February, 1926. A diagnostic curettage was done which was negative and she was given x-ray treatment. In December, 1927, all her flowing had ceased, but she had had no sign of the change of life except the cessation

of flowing. Inasmuch as the first patient had had a definite change of life and had had cessation of her attacks it was felt wise to repeat the x-ray treatment in this patient to see if the symptoms of the change of life could be brought on. As soon as this was done the attacks ceased and the patient has had none during the last 6 months while previously she was having about 10 per day. These two cases seem to suggest that abnormal uterine bleeding can have a very marked effect upon the general health of the patient and that whenever possible the abnormal bleeding should be checked.

Menopause. At all times the possibility of bringing about the menopause in a young person, whether by operation, radium, or x-ray, should be avoided. When, however, the patient reaches the menopause age the treatment can then be undertaken without regard to the change of life. In patients coming to this Clinic with cancer of the cervix before the menopause, who had large doses of radium and all of whom had the artificial menopause afterward, it is extremely rare to hear a complaint about the symptoms of the change of life. On the other hand, in those patients who do not have malignant disease and who have radium, x-ray or hysterectomy and have the artificial menopause, the complaints are very bitter. Hot flashes constitute but a small proportion of the symptoms, their chief complaint being depression and inability to sleep at night because of severe night sweats which wake them up about every two hours. Whether or not this type of menopause is worse than the normal cannot definitely be stated because some patients having the normal menopause have the same symptoms. The patient's complaints are so pathetic, they are so much to be pitied, that whenever possible one should avoid the artificial menopause, but the avoidance of it should be balanced carefully against the possibility of avoiding a serious operation with its mortality and morbidity and the question fully discussed with the patient before proceeding to any method of treatment.

CONCLUSIONS

In a Clinic dealing with malignant diseases or abnormal bleeding, 243 patients complaining of uterine bleeding have been seen over a period of four years. 34% of these had malignant disease and the rest were divided among many benign conditions, all of which can be treated successfully in one way or another. The chief lesson that can be learned from this report is the necessity of careful exploration of the vagina, cervix and uterus, in order to rule out malignant disease. The use of gland extracts has been spoken of in some detail and some of the results reported. Corpus luteum and thyroid extract are not cure-alls but are very helpful in some cases and should be considered before using surgery, radium or x-ray in the treatment of bleeding in young people. The artificial menopause should be avoided whenever possible and the problem openly discussed with each patient before deciding whether x-ray or radium with its ensuing menopause, or hysterectomy leaving in ovarian tissue, should be done.

CHART SHOWING DIVISION OF CASES ACCORDING TO DIAGNOSIS

Total number of cases..... 243

Carcinoma of Cervix	61
Carcinoma of Retained Cervical Stump	2
Adenocarcinoma of Fundus of Uterus	17
Leiomyoma	24
Leiomyosarcoma	3
Ovarian Cyst	9
Adenocarcinoma of Ovary	1
Endometrioma	5
Cervical Polyp	10
Endometrial Polyp	2
Lacerated Cervix	6
Vaginal Erosion	2
Bleeding from Cervical Stump	1
Senile Vaginitis	3
Incomplete Miscarriage	5
Pelvic Inflammation	12
Thrombopenic Purpura Hemorrhagicum	3
Atypical Purpura	11
Menorrhagia without Demonstrable Pathology	66

MULTIPLE SCLEROSIS—A PITFALL IN DIAGNOSIS*

BY MAURICE FREMONT-SMITH, M.D.†

ONE of the most difficult problems in diagnosis is the proper recognition of the neuroses. The internist is repeatedly forced to ask himself whether parathesias, headaches, dizziness, fatiguability, etc., can be explained on organic grounds, and has to answer this question frequently in the negative. In fact, as he becomes more familiar with the symptoms presented by the psychoneurotic, and the psychological backgrounds responsible for emotional strain, the diagnosis of maladjustment is made more often and with a greater sense of assurance.

One disease in particular must always be eliminated before this diagnosis is made. It is a disease apparently on the increase in this country, giving rise to a multiplicity of symptoms, often mild and of short duration and in many cases similar to those presented by the psychoneurotic. To emphasize its importance in diagnosis, I bring to your attention the following three cases:

CASE I. T. A. M., a woman of 55; history taken April 18, 1925.

Five years ago, the patient had partial loss of vision in the left eye. For one week she could not count fingers; then the sight returned. A competent opthalmologist made the diagnosis of retrobulbar neuritis. The sinuses were negative.

Four years ago, she had numbness of the right side of the face, lower gums and tongue. The tonsils were removed and the symptoms disappeared.

Three weeks ago, numbness was noticed in both feet and extended up to the knees. She felt tired in the legs and back when standing. The day before I saw her she had had tingling of the third, fourth and fifth fingers of the right hand, and of the left arm up to the elbow. Her appetite and bowels were unsatisfactory. There were no urinary symptoms.

Examination showed a healthy looking middle-aged woman of good color. Blood pressure 110/70. The pupils and ocular motions were normal. The knee jerks were very active. There was no clonus and no Babinski reflex. Romberg's sign was negative. There was no ataxia; no loss of toe position sense or vibratory sense; no objective anaesthesia.

On the basis of my negative findings, I made a diagnosis of psychoneurosis.

I never saw this patient again, but a neurologist friend was kind enough to call me up four months later, and tell me that he had found scanning speech, nystagmus, tremor, double Babinski reflex and suggestive ankle clonus; also that the patient had complained a great deal of backache and that when this backache was severe, her eye-sight became blurred. She died December 13, 1926. Autopsy showing scattered patches in the dorsal and lumbar cord, with proliferation of neuroglia, collections of small mononuclears in the perivascular spaces and abundant lymphoid cells throughout grey and white matter,—a picture typical of multiple sclerosis.

CASE II. D. D., a woman of 35, married, with five healthy children; history taken January 6, 1928. This patient was sent in for examination of the heart and lungs previous to a sacroiliac arthrodesis to be done the following day. She said that for two years she had had severe ache in the left hip and leg, and numbness of the left leg. She had been examined within a year by an excellent internist and had been in the hands of a competent orthopedic surgeon who, for a year, had given her exercise for her back. She had then gone to another able orthopedic man, who made a diagnosis of sacroiliac disease and advised operation. It is interesting that both patient and physicians were satisfied with the above history and the diagnosis dependent on it. The patient was annoyed by my asking her a number of seemingly irrelevant questions, which, however, resulted in the following information:

Nine years before she had noticed that bending her neck forward caused tingling in her hands and fingers and to a lesser extent in her feet. This tingling persisted while the head was held forward. Coughing, sneezing and lifting weights in her arms did not cause tingling of fingers or toes. (Questions asked with the thought of a high cord tumor in mind.)

Four years ago, following the birth of her fifth child and subsequent to some minor accident during labor (the patient states that she fell off the bed), she noticed numbness of both legs from the toes to the knees. At that time she thought she was going to be paralyzed, but she was considered neurotic and after she was up she noticed only easy fatiguability of her legs; there was also a tired, dragging feeling in the right lower quadrant (never definite pain), for which vague symptom her appendix was taken out, three years ago, without improvement.

Two years ago, her legs felt very numb and she was unable to judge the position of her feet so that when she stepped off the curb she would have to watch them; and bending her neck forward for that purpose again caused tingling in the fingers and toes. The left leg was more numb than the right and she began to notice an ache in the left "hip" region.

One year ago her legs crumpled up beneath

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†For record and address of author see "This Week's Issue," page 542.

her and she felt faint and sick, but later the same day walked upstairs to bed. Following this she could hardly walk and was given further exercises for the back.

Nine months ago, she experienced a period of improvement while in Bermuda away from orthopedic treatment. She even tried dancing, but found the left leg very stiff and weak after one dance. The ache in the left leg and a sharp scratch in the hip region persisted.

Six months ago, during the summer, the patient called herself practically well, only weariness in the left leg and lower left back persisted. The patient has recently noticed that she holds her urine much longer than normal and passes larger amounts at a time, and that the rectum is less sensitive than normally and a movement can be stimulated only by enema.

At the time of examination, the patient admitted numbness over the whole left side of the body, especially noticeable in the left palm at the base of the fifth finger and up over the ulnar surface of the arm. (The patient volunteered that if she leaned against a very hot radiator, the sensation of the left side was not commensurate with the actual degree of heat.)

Further direct questioning brought out the fact that ten years ago there had been a period of three weeks during which the patient had had persistent diplopia, seeing one image above the other; three summers ago, the diplopia recurred for one week; and three months ago, she experienced definite impairment of vision over a period of several weeks. Blurring of the right disk and definite scotomata with contraction of the visual fields were found at that time.

The past history was frankly negative except for diphtheria, measles, whooping cough, and frequent sore throats in youth. The patient had had a toxemia with her first pregnancy. She had been constipated during the present illness only. There had been no headaches or dizziness.

On *physical examination*, the blood pressure was 115/80; pulse 70; the pupils were equal, round, and reacted to light and distance; the ocular motions were normal; there was no nystagmus, no cranial nerve paralysis; the mouth and throat were negative; the tonsils were moderate in size and buried; the lymphatic glands, breasts, and thyroid were negative, as were the heart, lungs and abdomen; x-rays of the teeth and sinuses were negative; the knee jerks were equal and very active; there was no clonus and no Babinski reflex; no motor weakness was demonstrable, but ataxia of the left leg was present; there was definite anaesthesia over a small area in the left palm and hypaesthesia over the left ulnar distribution and, to a lesser extent, but especially marked to heat and cold, over the whole left arm and left side of the trunk and left leg; the left Achilles jerk was absent; toe position sense was absolutely lacking on both sides but vibratory sense was only slightly decreased; the abdominal reflexes were absent; there was no speech difficulty and no tremor.

Laboratory Findings: The urine and stool were negative; the white count was 6,600, red count 4,230,000, hemoglobin 80 per cent. (Tallqvist); blood smear showed normal red cells and platelets; blood Wassermann test negative.

Lumbar Puncture: Initial pressure 90, rising to 120 on unilateral jugular compression; cells 12, all mononuclears; total protein 37; ammonium sulphate positive; Wassermann test negative; gold sol 4543211000.

Progress Notes: This patient was first seen January 6, 1928.

In March, 1928, the subjective symptoms of numbness and stiffness moved from the left side to the right side of the body, and into the right leg, and have remained more marked on this side since. It is suggestive that the back pain at this time also moved from the left to the right hip region.

In May, 1928, she had one severe attack of nystagmus, vertigo and vomiting, of sudden onset and short duration (2 weeks), following which the nystagmus completely disappeared and has not recurred. With this attack positive left Gordon and Babinski reflexes were found. These reflexes were later normal—in September, 1928, January and February, 1929. The patient walks now with more difficulty than when first seen, but the general course of the disease has been only mildly progressive.

Case III. J. T. B., a man of 28; history taken May 24, 1928.

Except for a partial dislocation of the neck at 11, scarlet fever and albuminuria in childhood, the patient was well until 18, when he had a sudden loss of vision in the left eye lasting two months. Three years later, he had had a second attack of visual disturbance in the same eye, lasting four weeks. At that time there was not absolute blindness, but the eyes did not focus together, objects appearing further away in the affected eye. A third attack began six weeks ago, the vision becoming blurred in the left eye, and at the same time the appetite was lost and the stomach felt "uneasy."

At 22, he had jaundice, following which he was troubled with sudden violent attacks of vertigo and vomiting, which would waken him from sleep. These attacks grew less violent and less frequent, and disappeared at the age of 25, but even now bending the head backwards will cause slight dizziness.

At 23, he had an acute intestinal upset with pain, leading to a suspicion of appendicitis. At this time he noticed numbness, first felt in the toes of the left foot, then in the right. This numbness has reappeared in attacks lasting one to two months, sometimes in both feet, sometimes in one. It is rarely felt higher than the ankle but occasionally to the knee, and is associated with a little floundering in walking.

Numbness has also been noticed in the ends of the fingers of both hands.

For the past year and a half, he had been free of numbness until six weeks ago, when it reappeared synchronously with the visual disturbance described above.

There was no history of diplopia, of vesical or rectal disturbance, tremor or speech difficulty.

Examination showed a healthy-looking young man, with good color, normal pulse and blood pressure. The pupils were equal and reacted to light. There was no nystagmus. The whole left disk was pale; the right disk normal in color. The knee jerks were equal and active; there was a questionable left Babinski reflex, Gordon's reflex was negative. Abdominal reflexes were absent. The toe position sense was normal; vibratory sense diminished on both ankles. No tremor. Basal metabolism was plus 11 per cent. Spinal fluid showed 6 cells, a negative Wassermann test and a gold sol curve of 2232100000.

Progress Notes: In June, 1928, there was sudden onset of complete ataxia of the right arm and hand. The patient could not write, and had to look at his hand to tell its position. After four weeks this symptom cleared up.

In February, 1929, there was sudden paralysis of the left sixth nerve, with diplopia, complete recovery taking place in three weeks.

DISCUSSION

It is not to the neurologist but to the internist and surgeon that these cases should be of interest. Two of these patients had been repeatedly examined by internists of ability; one had been in the hands, successively, of two of our best orthopedic surgeons. That the diagnosis was suspected by no one of these men (as it was not), shows the total lack of familiarity with this disease that exists outside the neurological group. You will recall that one case had had a needless major operation and was about to be submitted to a second.

I would emphasize that if a diagnosis is to be made, the disease must be suspected from the history; moreover that the casual history taken without this condition in mind will fail to discover the evidence upon which a diagnosis may be made. One of these patients had entirely forgotten a period of double vision of three weeks' duration ten years before. To the patient this episode seemed too remote, both in time and in bodily geography, to have any relation to her chief complaint of backache. The first case volunteered a history of temporary diminution of vision, and numbness of the face, but at the time these symptoms suggested nothing to me, and I am therefore not surprised to find no mention in my notes as to nystagmus or abdominal reflexes, though that an attempt at thorough examination was made is attested by notes on toe-position sense, vibratory sense and cutaneous sensation. In other words, a definite concept of the disease must be in the mind of the physician if a diagnosis in the earlier stages is to be made.

Multiple sclerosis is a disease characterized by marked periodicity, variability and multiple distribution of symptoms, and by complete and long remissions. The *earliest symptoms* are usually either impairment of vision or diplopia, or numbness, tingling and easy fatiguability of the lower extremities. These are often isolated symptoms occurring years before the onset of the present illness. There may be sudden unexplained spastic paraplegia or monoplegia. The sensory symptoms are usually vague, but pain (location not stated), was reported present in 30 per cent. of the cases studied by the Association for Research in Nervous and Mental Diseases (1921). Pain in the back was a prominent symptom in two of my three cases, and an examination of the case histories at the Peter Bent Brigham Hospital shows backache to have been a marked symptom in nine out of thirty-three cases of multiple sclerosis. Bladder symptoms are common, but often so mild as to escape notice except through direct questioning.

As to *signs:* a diminution or loss of the abdominal reflexes in a healthy abdominal wall, pallor of the whole or the temporal half of the optic disk, and contraction of the visual fields with enlarged or multiple blind spot, are usually the earliest changes. Increased knee and ankle jerks and areas of patchy hypaesthesia are common. Later, nystagmus, speech difficulties and tremor make the classic symptom group, although Sachs says he considers slight nystagmus, diminution of the abdominal reflexes and the presence of a moderate spastic paraplegia to be more characteristic of the disease than the Charcot triad. It is interesting that in the three cases here reported nystagmus was present in none when the patients were first seen. In two it appeared later, disappearing completely and so far permanently, in one of these, after two weeks. Disappearance of an established nystagmus is held to be unusual in this disease.

I am impressed by the presence of backache as a prominent symptom in two of these cases. That this symptom was caused by the spinal cord lesions and not by an attendant muscular strain is evidenced by the synchronous increase in the backache and visual impairment in one case, and by the shifting of the pain, together with the paresthesia and weakness from the left to the right side of the body in the other.

When the suspicion of multiple sclerosis arises, examination of the *spinal fluid* often affords definite corroborative evidence. The fluid is said, in the literature, to be negative in about half of the cases, the other half showing increase in cells, in globulin, or an abnormal gold sol curve. In a patient who has not had antiluetic treatment, a paretic curve together with a negative Wassermann is diagnostic.

Dr. Frank Fremont-Smith has recently gone over the records of 40 cases of multiple sclerosis at the Massachusetts General and the Boston City Hospitals. He finds 72 per cent. of the spinal fluids in this group to be abnormal either as to cell count, quantitative protein, or gold sol curve. If one then does a complete examination on the spinal fluid, an entirely normal fluid will be found in approximately only one-quarter of the cases.

Conclusions: The incidence of multiple sclerosis is increasing in this country. It is no longer a rare disease. Its recognition depends upon a history taken with multiple sclerosis in mind. Unexplained retrobulbar neuritis, paralysis of the ocular muscles, or weakness and numbness in the legs must be viewed with especial suspicion. Pain in the back is not an unusual symptom. A complete examination of the spinal fluid will show abnormal findings in three-quarters of the cases of multiple sclerosis. Multiple sclerosis must often be excluded before a diagnosis of maladjustment may be made with safety.

PAPERS READ BEFORE THE INTERNATIONAL PSYCHOLOGICAL CONGRESS

Professor Ivan P. Pavlov, of Leningrad, described the close and strategic connection between the hemispheres of the brain which form the switchboard for the most complex conditioned, or learned, reflexes, and the sub-cortical part of the brain lying immediately beneath the hemispheres, which is the center for the most complex unlearned reflexes such as those dealing with food, sex and self-defense. Dr. Pavlov said:

"On the basis of the most recent experiments, I find it justifiable to separate the reflexes of these two centers from the rest of the nervous activity under the special name of the highest nervous activity." The study of the mutual relation of these two highest parts of the brain must become one of the most important problems of the highest nervous activity. The cortical conditioned reflexes are formed by means of the sub-cortical centers. A certain degree of excitability of these centers is the essential condition for the formation of the connection between cortical cells and sub-cortical centers. For instance, if an animal is already fed before an experiment, it is difficult or even impossible to form the conditioned reflexes on food. Professor Pavlov's experiments lead him to the conclusion that the strength and real significance of the activity of the brain hemispheres rests upon the activity of the centers just below the hemispheres. And, on the other hand, the hemispheres serve as regulators of the centers below. The cells of the brain hemispheres are continually protected against overstimulation. If a stimulus from without exceeds the maximum limit, inhibition sets in to prevent the brain cells from so intense a stimulation. The same sort of inhibition acts as a guard if the sub-cortical centers become over-excited and attempt to send in too intense messages of hunger, for instance, to the highest brain centers. Referring to the inhibition resulting from too intense excitation in the sub-cortical center, Professor Pavlov explained that "this fact is obviously a vital one, as it distorts the actual normal relations and furthermore gives a satisfactory explanation of hysteria."

Professor H. Pieron, of the Collège de France, stated that there is no pain sensation, though, when you cut your finger, you may be under the impression that you are experiencing a sensation of pain. Pain is really an emotional level which may be reached when certain specific sense organs are stimulated. The list of the five familiar senses, sight, hearing, smell, taste and touch, has long ago been expanded by psychologists to include the muscular sense, temperature sense, and sometimes several others, but if Professor Pieron's interpretation is accepted, pain would not be included.

Professor Goodwin Watson, of Teachers College, Columbia University, New York City, asked four hundred students to tell whether they considered themselves happy or miserable, rating themselves on a scale of six degrees of happiness and unhappiness. Then he asked them to give a number of facts about themselves. As a result he found that the happy student is likely to be a man. He is likely to be above average in health; active in the life of the college; to believe himself able creditably to tell jokes, lead a discussion, act in a play, give a talk on sex, or administer a group of workers; to have a harmonious home; to enjoy his job; to like adventure. Intelligence appears to have nothing to do with happiness. Nor is much importance to be attached to race, physical disability, size of one's home town, financial, social or educational status of family, nor to personal estimates of ability at sports or at the various arts.

Professor Stefan Blachowski, of the University of Poznan in Poland, questioned several hundred students at the university and has found that 54 per cent. of them have the inclination to count objects, to a greater or lesser degree. Professor Blachowski said that heretofore attention has been attracted chiefly to the extreme and abnormal cases, such as individuals who feel themselves compelled to count the steps they take or the words they hear, and who become enslaved to a habit that they feel helpless to shake off. Among the university students, counting was more prevalent among women than among men. About two-thirds of the women had the inclination, as compared with less than half of the men. The objects the different students counted make a long list. Among the most popular were planks in the floor, wallpaper patterns, windows, pictures, buttons, stops during a walk, trees, autos, books on shelves, equipages at funerals, stakes in fences, houses from one end of the street to the other, letters, money and railway cars. The statement made by one student applies to most of the cases—"If I see something arranged in a row, pictures on the wall, for instance, I count them." Another student said that when he took a railway journey he always counted the stations and the houses and jotted down his precise observations in a diary. Since so many normal people occupy their minds with this form of thinking, Professor Blachowski believes that the matter should be studied more deeply than when it was merely supposed to be a phase of mental disease.

(Concluded on page 540)

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 15371

ACUTE ARTHRITIS WITH DYSPNEA

MEDICAL DEPARTMENT

An American boy fifteen years old entered October 2. The history was given by his father and mother.

At two years he had an attack of rheumatic fever—swelling and pain in the joints of the right foot lasting two days. At eight he had a second attack, lasting a week. He was well for some months. Then he had pain starting in the groins and gradually involving every joint in his body. He was in bed for a week and in a wheel chair for six weeks. During this time chorea developed. He also had a transient blindness in both eyes for two days. He was in a hospital for two months, flat on his back during the entire stay. The attack lasted in all from August until March. From this time he was an invalid, not able to play or go to school, and spent much of the time in bed or in hospitals. His pulse rate had never been below 110 for six years. He never had another attack of rheumatism or chorea. Once or twice a year, usually in the winter, he had an attack of swelling of the legs with increased dyspnea. The present illness is typical of these attacks. The attack began three months before admission with swelling of the legs. This gradually extended to the genitals and abdomen. Since the onset of the edema he had passed very little urine. His mother had given him ex-lax and sal-hepatica daily for three months. For the past week he had had slight head cold and cough, had been orthopneic, and had had the only pain he had ever complained of, a low midline back pain, due his mother thought to his uncomfortable position in bed. For three days he had been very ill with ascites, edema of the extremities and genitalia, orthopnea, restlessness and an irregular and rapid heart.

His mother had had one miscarriage.

Six years before admission he had tonsillectomy and adenoidectomy.

Clinical examination showed a poorly developed and nourished boy, pale, cyanotic and dyspneic. Mouth dry. Sordes on tongue and gums. Teeth nearly all carious. Pyorrhea. Precordium prominent and bulging with each heart beat. Apex impulse in the anterior axillary line. Left border of dullness 11 centimeters to the left of midsternum, 4.5 centimeters outside the midclavicular line, right border of dullness 4 centimeters, supracardiac dullness 6. Enlargement in the left auricular region. A questionable systolic thrill at the apex. Murmurs questionable. Rate at apex about 180, at wrist about 84. Pulse irregular and at the wrist very feeble. An electrocardiogram showed auricular fibrillation, rate 100 (?), marked right axis deviation, index —24, angle +132, diphasic T_1, low T_2. Systolic blood pressure about 90 to 118, diastolic 65. Lungs examined only superficially; no abnormalities found. The abdomen showed a moderate amount of fluid and a questionable mass in the right upper quadrant. A slight amount of fluid in the scrotum and penis. Moderate edema of the legs. Slight edema of the arms. Ecchymoses over both knees. Large scaly fissured dry plaques over the left palm and the left heel.

Urine: amount normal, specific gravity 1.022 to 1.028, a slight trace of albumin at one of two examinations, occasional leukocytes once. Blood: leukocytes 18,750 to 7,700 to 30,000, polymorphonuclears 82 per cent, hemoglobin 90 to 85, reds 4,750,000, slight anisocytosis, smear otherwise normal. Hinton not recorded.

Temperature 98° to 102.8°, rectal. Radial pulse 62 to 106, apex 78 to 140; deficit to 65 beats. Respirations 21 to 37.

X-ray examination showed the cardiac shadow very much enlarged, obscuring the lower two thirds of the right lung field. The shape of the shadow was more suggestive of an extremely dilated heart than of fluid in the pericardium.

Under digitalis the heart became much quieter and the pulse deficit diminished. The edema was however unchanged. The patient was quite comfortable October 5, but entirely too active. By October 8 he was very uncomfortable, complaining of pain in the right chest. The lungs were filled with râles. The temperature was rising. That night he became very restless, jumped out of bed once and moaned a good deal. The heart was pounding, rate 140, the pulse very weak, with enormous deficit. He remained in about the same condition until three o'clock the morning of October 9. Then with a sudden cry he died.

DISCUSSION

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

I do not know the cause of that pain eight years ago. Maybe it was embolic. If it was we must think of something washed off a heart valve, and therefore of endocarditis.

If you have ever spent much time in bed you know that is a common place to have pain—the midline of the back.

Up to the physical examination I should say he had a history of rheumatic heart disease. We need not look further than that. Of course

that means pericardium as well as heart; we have to consider the whole as well as a part of the circulatory apparatus.

Why do you suppose there was nothing said about fever in this history? It seems to me that he should have it. I suspect that it is because he has so much dyspnea and keeps his mouth open, so that the thermometer did not register. A person who is very dyspneic opens his mouth just as you do when running fast; you want to get all the air you can.

NOTES ON THE PHYSICAL EXAMINATION

Eleven centimeters to the left of midsternum in a child of fifteen is a good deal.

It is a pity that you and I were not there to put that "questionable murmurs" down more definitely. Questionable murmurs have no real right to be recorded.

That mass in the right upper quadrant was probably the liver.

I do not know what to say about those plaques on the palm and heel.

82 per cent. polymorphonuclears is suggestive of some acute infectious process besides his chronic heart trouble.

May we look at the chart? Considering the fact that these are all rectal temperatures the chart does not show much fever. During the first half there is no fever, and not very much after that.

The question between dilated heart and pericardial effusion is a problem we always ask an X-ray man to help us about, and he is rather apt to hedge; but on the whole he came down on the side of a big heart in this case.

MISS PAINTER: Dr. Dresser said that the appearance is not suggestive of fluid; that in fluid the heart would be more symmetrically enlarged, and that in this case the heart is enlarged more to the left than to the right and the outline of the right auricle is fairly distinct.

DR. CABOT: At the end they suspect that he had a choreic attack at the same time. Ordinarily cardiac patients keep quiet.

DIFFERENTIAL DIAGNOSIS

We start with what he had before admission, that is, rheumatic heart disease. We have to look over the possibilities shown during his hospital stay. The thing that I feel is most probable is an adherent pericardium. Children with rheumatic heart disease, especially with a long-standing heart disease like this, are more likely to show chronic pericarditis than any other one thing you can name. Second we must consider a mitral stenosis because of that evidence of big right ventricle from the electrocardiogram. Beyond that it is all guess work. It is perfectly possible that he has aortic and tricuspid trouble also. That could be there without any more or less signs than we have here. In long-standing cases there is a good chance that the disease gets beyond one valve. On the other hand it may be confined to the mitral. I believe it is an adhesive pericarditis with possibly mitral stenosis and not impossibly one or two more valve lesions. The rest of the body ought to show results of passive congestion. The only remaining question is, did he have an acute endocarditis on top of this chronic process? He is at an age when that is much commoner than it is in adults. There are some things in the case, especially the leukocytosis, which make me think that is possible. On the other hand we have neither of the two confirmatory signs of endocarditis that we are always looking for in acute endocarditis, namely positive blood culture and embolism. He did not show anything that is suggestive of embolism while he was here, although we remember the account of his earlier symptoms. They may have been embolic.

A STUDENT: Is there a possibility of pneumonia?

DR. CABOT: There is. I do not think we can say any more than that.

A STUDENT: Does that X-ray show it on the right?

DR. CABOT: No, I should not say so. That shadow is all heart and pericardium. But it might perfectly well be fluid in the pericardium in case I am wrong about the adhesions.

A STUDENT: What is the reason for supposing pericardial adhesions?

DR. CABOT: The reason is that this is a case of long-standing heart disease in a child. Knowing that fact, without even reading the history anyone would suspect adherent pericardium.

A STUDENT: What do you think was the cause of death?

DR. CABOT: I have no idea. He died of heart disease. This is the regular history of it, and he has general passive congestion, which are points in themselves perfectly sufficient. You ask about the sudden edema at the end. I have nothing more to say. I do not know.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Rheumatic heart disease.

DR. RICHARD C. CABOT'S DIAGNOSIS

Rheumatic heart disease.
Adherent pericardium.
Mitral stenosis.
Possibly endocarditis of the aortic and tricuspid valves.
Chronic passive congestion, general.
Pneumonia.

ANATOMIC DIAGNOSES

1. *Primary disease.*

Rheumatic myocarditis, mitral and tricuspid valves, without stenosis or noteworthy insufficiency.

Rheumatic endocarditis, particularly of the left auricular wall.

2. *Secondary or terminal lesions.*

Hypertrophy of the right ventricle.
Chronic passive congestion, general.
Chronic passive congestion of the liver plus toxic cirrhosis.
Anasarca.

DR. TRACY B. MALLORY: This boy had a rheumatic heart disease with considerable hypertrophy and a greatly dilated heart. There was thickening of both the visceral and the parietal pericardium of an old fibrous type, though without adhesions. There was only a small amount of fluid, about 150 cubic centimeters. The mitral and tricuspid valves both showed fibrous thickening. The mitral however was not stenotic, the circumference measuring nine centimeters, and three fingers could easily be passed through the lumen. The chordae tendineae were very slightly shortened. It is possible that there was a trace of regurgitation, but not much. The lesion of the tricuspid valve did not seem to be such as could produce any impairment of function. The most definite change in the heart was a marked fibrous thickening of the intima of the left auricle with considerable degenerative change of the muscular tissue in the deeper layers. There was no acute endocarditis. There was no evidence of pneumonia. He did have a pulmonary infarct at the right base which was relatively recent, but could not be immediately connected with his death. It must have been present for two or three days.

Recently we have seen one or two other hearts essentially like this, clinically cases of rheumatic heart disease, giving most and in one instance all the signs of mitral stenosis but showing no mitral stenosis at autopsy and no anatomic lesions marked enough to explain the definite functional impairment. Microscopic examination does show a very considerable degree of involvement of the myocardium, perhaps twice as much as the average non-acute rheumatic heart coming to autopsy.

A STUDENT: How much was the heart hypertrophied? What is the weight of it?

DR. MALLORY: It weighed 545 grams. That is pretty large for a boy of fifteen.

A STUDENT: The right ventricle was more hypertrophied than the left, was it not?

DR. MALLORY: There was no hypertrophy of the left ventricle. The wall of the right ventricle was twice as thick as normal and the cavity at least twice the size of normal.

DR. CABOT: Is there nothing to be said as to the cause of that?

DR. MALLORY: Nothing, except that one other case very similar to this in character did also show very marked involvement of the left auricular wall, enough so that one can assume that the left auricle may have been rather largely impaired in its function. On the other hand cases of auricular fibrillation do not necessarily show any marked hypertrophy of the left ventricle at autopsy, though they ought to.

DR. CABOT: A few years ago I went over all the autopsies of heart cases from 1902 to 1926. I do not remember anything at all like this. It does not astonish Dr. Mallory as much as it does me.

DR. MALLORY: It is the second case we have had in four months. It is put down as rheumatic heart disease and I think a pure rheumatic myocarditis.

DR. CABOT: On the whole you think that is the reason that the heart gives out?

DR. MALLORY: Yes.

A STUDENT: Do you think this myocarditis is an acute process or do you think it is a hangover?

DR. MALLORY: There is very little evidence of an acute myocarditis here. It is a very chronic affair.

A STUDENT: Why did the patient die with that sudden cry?

DR. CABOT: Many cardiac cases do that for no reason at all that is anatomically evident. If you come to tabulate the causes of sudden death the diagnosis that ought to go at the top is "I do not know". That is after autopsy. We always used to come down to autopsy expecting the pathologist to tell us the cause of sudden death. We know now that the chances are that he will not tell us. It is only in the minority of cases even after autopsy that we know the cause of sudden death.

CASE 15372

DELIRIUM, INSOMNIA AND CYANOSIS

MEDICAL DEPARTMENT

A Canadian carpenter seventy-two years old entered January 8. An inadequate history was given by his daughter.

Until a month before admission he had considered himself in the best of health, although he had had swelling of the ankles for many years. A month before admission he "broke wind" on lifting a heavy weight and since that time had had dyspnea, especially during the past two weeks, increased by the slightest exertion, even eating. It was accompanied by cough and sputum which his wife said was like that of a patient with pneumonia (i.e., rusty?). For two weeks he had been unable to sleep. Two days before admission he became cyanotic and restless. Since the morning of admission he had been delirious.

His family history is negative except that one child died of quick consumption.

His past history was negative so far as his daughter knew.

Clinical examination showed an overnourished man, delirious, sitting up in bed with flushed face, cyanotic lips, and moderate dyspnea. The sclerae showed a suggestion of icterus. Pinpoint

pupils. Soft subcutaneous tumor over the right frontoparietal region. Carious tooth roots. Mouth dry. Throat diffusely reddened. Râles at bases of both lungs. Probably a small amount of fluid at the right base. Location of the apex impulse of the heart not recorded. Left border of dullness 10 centimeters to the left of midsternum, 1 centimeter outside the midclavicular line, right border 3 centimeters to the right, supracardiac dullness 5. Rhythm irregular. Sounds of poor quality. Heart fibrillating. A systolic murmur at the apex. Artery walls palpable and tortuous. Blood pressure 130/78 to 140/60. An electrocardiogram showed auricular fibrillation, rate 120, left axis deviation, inverted T_1, diphasic T_2, upright T_3, wide QRS_1, deep S_2. The abdomen showed a tender tumor in the midline rising out of the pelvis and extending to within 5 centimeters of the umbilicus. Rectal examination showed a prostate enormously enlarged but with no induration or alteration of anatomical relations. The entire left leg was larger than the right. There was a sense of bogginess and slight edema throughout. In the lower third of the right leg on the lateral side was a large, irregular, deeply ulcerated lesion covered with coarse granulations and necrotic tissue. The skin over the lower legs was thick and brown.

Amount of urine normal when recorded, specific gravity 1.016 to 1.020, a slight trace of albumin at one of three examinations, a few leukocytes at two, one a catheter specimen, red cells at all, from 1 to 50 per field. Renal function 15 per cent, markedly off color at two examinations. Blood: 23,500 to 16,100 leukocytes, 88 to 89 per cent polymorphonuclears, hemoglobin 60 to 70 per cent, reds 6,130,000 to 6,050,000, some anisocytosis, slight achromia; a few nucleated red cells in one of two smears. Hinton negative. Non-protein nitrogen 120 January 8, 86 January 10. Icteric index 40.

Temperature 98° to 102.1°, rectal. Pulse 65 to 115, radial, 85 to 126 at the apex; deficit 9 to 24 beats.

At X-ray examination all details were obscured by respiratory motion. There was apparently increased density at both bases, somewhat more marked on the right, probably pneumonic in origin.

The patient showed marked Cheyne-Stokes respiration and was noisy and restless with each hyperpneic phase. He was put upon constant drainage with forced fluids. Morphine did not control the Cheyne-Stokes. The condition grew rapidly worse. The ulcer became much cleaner with frequent dressings with tincture of myrrh. January 13 both chests were full of coarse bubbling râles, more marked on the right. The patient became very cyanotic and died.

Discussion

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

That is the ordinary history of cardiac failure in a patient of the arteriosclerotic type, the type that is very prone to be delirious even with nothing more than heart trouble to be discovered post mortem.

NOTES ON THE PHYSICAL EXAMINATION

The electrocardiographic evidence points to myocardial damage. Inversion of the T wave in the third lead is less significant than it is in the first and second. But that with the wide QRS seems good evidence of myocardial damage.

I do not know any special reason to doubt that he had a varicose ulcer. There is nothing said about varicose veins, however, and it is a little strange to see ulcer without the evidence of dilated veins. Brown skin over the legs goes very often with varicose malnutrition.

I do not think we have clear evidence against the kidneys. It is the sort of case in which we suspect kidney disease. It may be there. But I have seen cases with all these findings and nothing to show for them in any way at post mortem. The non-protein nitrogen of 120 is the best evidence that we have in favor of kidney disease. That with the slightly abnormal blood seems to me the best evidence we have in favor of nephritis.

An icteric index of 40 is notably high. That is interesting, because they are quite uncertain as to whether he had jaundice on looking at his sclerae.

Miss Painter: One of the X-ray men said the X-ray findings might be all due to fluid.

Dr. Cabot: From the films I certainly should not be able to say any more than passive congestion of the lungs with presumably some fluid on one side. We do not see the diaphragm on either side.

DIFFERENTIAL DIAGNOSIS

I am inclined to feel that his prostate is as near the primary cause of his trouble as anything that we can assign. No doubt this cardiac weakness dependent upon a hypertensive type of cardiac disease is also a factor. He had prostatic obstruction, with back pressure upon the kidneys, and hence a high non-protein nitrogen. That seems to me reason to suppose that the kidneys were not doing their full work, although I never should have suspected it from the urine itself.

In the heart we have no evidence of any gross myocardial lesion like infarction. But I think we have reason to suppose there is more weakness in the myocardium than a person has a right to have at his age. I believe the heart is hypertrophied. The clinical evidence points

that way, and no doubt it was a factor in his death. Was the brain opened?

DR. TRACY B. MALLORY: No.

DR. CABOT: It probably showed arteriosclerosis. There is no reason to suppose any more definite vascular lesions than that. The delirium that he had in the beginning is very common in this type of case even when nothing special is found in the brain.

Has he acute infection in the lungs? I think there is a good chance for it. On the basis of the clinical signs we can say no more.

He ought to have a cystitis, very possibly a pyonephritis from his old prostatic obstruction. I do not doubt that the elements of infection, uremia and cardiac failure all combined to produce his death. Of course there ought to be chronic passive congestion. I doubt whether his leg ulcer has any important relation to the rest of the case.

A STUDENT: What type of heart disease do you call it?

DR. CABOT: Hypertensive.

A STUDENT: There is too small a number of leukocytes in the urine to show cystitis, isn't there?

DR. CABOT: Yes; there ought to be more. I do not know why he has so few. But I do not see how he can have had so large a bladder and have had prostatic disease as long as we think he has had it, and still no cystitis. The urine does not show it, certainly.

A STUDENT: Why is there a difference in the size of the legs?

DR. CABOT: I do not know.

A STUDENT: Couldn't the size of the bladder account for it?

DR. CABOT: I do not see how it could exert pressure on one side. Have you any idea?

A STUDENT: I do not know exactly, but the veins are not symmetrical.

DR. CABOT: It does not seem to me that there is enough evidence to say there was a phlebitis there. I hope we shall get light on that.

A STUDENT: Do you make any distinction between hypertensive and arteriosclerotic heart disease?

DR. CABOT: I do not think we have any right to make a diagnosis of arteriosclerotic heart disease. Dr. Paul D. White, who is now in Capri, has used that word a good deal, but I think he does not use it now. I do not think we have any right to use it. We very often find extensive general arteriosclerosis without heart disease. Aside from coronary sclerosis we do not know that there is any arteriosclerotic form of heart disease.

A STUDENT: What is the relation between arteriosclerosis and hypertension?

DR. CABOT: I do not know.

A STUDENT: But you commonly get death from hypertension without arteriosclerosis. Then you have another cause; and yet the diagnosis in both cases is the same.

DR. CABOT: What strikes me is that so far as the circulation is concerned you may have all the same lesions with arteriosclerosis and without arteriosclerosis. Hence you cannot say that arteriosclerosis is a causal factor.

A STUDENT: In one case you have myocardial damage and in the other simple hypertension?

DR. CABOT: No, I should not say that. I do not know of any myocardial damage from arteriosclerosis unless it is in the coronaries. I have seen many cases with very marked peripheral sclerosis without any myocardial damage at all.

A STUDENT: If this turned out myocarditis you would call it coronary disease of the heart?

DR. CABOT: It is quite possible that myocarditis is there, but we cannot say so because he has had no coronary symptoms.

A STUDENT: How do you explain the icterus?

DR. CABOT: I suppose it is from congestion of the liver.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Arteriosclerotic heart disease.
Fibrillation.
Decompensation.
Bronchopneumonia.
Chronic nephritis.
Uremia.

DR. RICHARD C. CABOT'S DIAGNOSIS

Obstructing prostate with back pressure on the kidneys.
Nephritis.
Cystitis.
Hypertensive heart disease.
Hypertrophy and dilatation of the heart.
Arteriosclerosis.
Possibly acute infection in the lungs. (Pneumonia?)

ANATOMIC DIAGNOSIS

1. *Primary disease.*

Bronchopneumonia.
Hypertrophy and dilatation of the heart.

2. *Secondary or terminal lesions.*

Infarction of lung.
Infarction of kidney.
Arteriosclerosis.
Pulmonary arteriosclerosis.
Benign hypertrophy of prostate.

DR. MALLORY: This man seems to have had almost all the things that were prophesied for him and a few more besides. He had marked hypertrophy and dilatation of the heart, quite

marked emphysema, bronchopneumonia. He had separate from the bronchopneumonia several infarcts in the lungs. He also had numerous infarcts in the kidney. There was a moderate degree of arteriosclerosis in the kidneys and in the smaller vessels of the spleen, compatible with the hypertension. There was quite a marked arteriosclerosis of the smaller pulmonary arteries, also a common finding associated with emphysema. He had a large benign hypertrophied prostate and a quite severe cystitis, but it had not backed up beyond the bladder. The ureters and pelves of the kidneys were free.

A STUDENT: Was there no vascular nephritis?

DR. MALLORY: That is a question of terminology. He certainly did not have extensive enough vascular lesions in his kidney to have caused true renal insufficiency.

A STUDENT: What about the coronary arteries?

DR. MALLORY: They were entirely negative.

PAPERS READ BEFORE THE INTERNATIONAL PSYCHOLOGICAL CONGRESS

(Concluded from page 534)

Dr. George H. Green, of University College of Wales, speaking before the International Congress of Psychologists, said that he found indisputable evidence that Welsh children do display racial prejudices. Books are of greater importance in forming the opinions of children regarding alien races than either school or religious instruction, he found. The rôles played by the Negro and Chinese in moving picture dramas have strongly influenced childish opinion regarding these races. But the movies do not seem to have affected the attitude of Welsh children toward Americans. Facts collected regarding the influence of books, movies, newspapers, religious institutions and other agencies that shape children's opinions toward the races of the world can be used to make these agencies more effective in a constructive way, the educator pointed out.

The child who persists in pushing his pen backhand style in spite of school fashions in penmanship is really seeking to attain a harmony of movement, in accordance with his own physical traits. Even though he may not be recognized as a left-handed individual, his desire to slant his writing backward is an indication of some left-handed or left-eyed trait, according to Dr. June Downey, of the University of Wyoming. Forty-five supposedly right-handed individuals who slant their writing back were studied. Some of these were left-handed children who had been taught to use the right hand. Some were ambidextral. Fully sixty per cent. of the group either had the left eye dominant, or else the two eyes were impartially depended upon. The backward slant of writing favored by left-handed persons and the forward slant more customary among right-handed persons suggest a centrifugal preference of movement.

Children take, on the average, twenty minutes to go to sleep. This is the finding of the mothers of one thousand children under eight years of age who have kept records in co-öperation with Dr. Josephine C. Foster, of the Institute of Child Welfare at the University of Minnesota. Describing the sleeping hours of children, Dr. Foster stated that children less than six months old sleep about fifteen hours a day. Children seven years old sleep practically eleven hours. Averaging the records of children of all ages and records of all seasons of the year, the time required for dropping off to sleep was twenty minutes. Late hours, popularly associated with city life, do not affect city children. Country children went to bed later and rose earlier. This difference is particularly striking in the spring.

Fear of the unknown plays a major rôle in the drama of every human life, according to Dr. L. Seif, of Munich. When a child begins to ask "why" at four years of age he is already trying to overcome the feeling of uncertainty and anxiety that human beings naturally hold toward what is strange. Strange experiences and objects are new, uncertain, dangerous, and such things are faced throughout life with anxiety. What is known, on the other hand, is safe and inspires confidence. If a child receives from his educators the right preparation—love, confidence, encouragement and suitable training for overcoming the difficulties of the strange—he then learns always better to transform the strange into the known. If a child is spoiled, he does not learn to deal courageously with the strange. His experiences are characterized by disappointment, anxiety and withdrawal. A pessimistic response to strangeness in life constitutes the basis of many mental and nervous disorders.

The personal relation of the actor toward his rôles has been studied by Professor John T. Metcalf, of the University of Vermont. Professor Metcalf said that the actor enjoys his work when he is satisfied with his art, and his work is unpleasant when he feels his own shortcomings. The actress who weeps through a tragic love scene and has her audience weeping with her is probably thoroughly enjoying the evening's work. The actor who is so despicable a character that the audience yearns to come up on the stage and take a hand in his downfall probably has no feeling of repugnance toward his part in the drama. To what extent an actor feels the emotions he portrays has long been a matter of interest and dispute. Professor Metcalf concludes that the actor does imaginatively identify himself with some person and situation outside of himself. And the more fully he is capable of this, the more successful he will be in conveying the desired effect to the audience. But if he begins to experience the real sensations of anger or sorrow, he slips up in his art, for then he is behaving in a real and practical way instead of using his art to represent an imagined situation in the realm of unreality.—*Science.*

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THE NATURE OF ICTERUS NEONATORUM

ICTERUS NEONATORUM, common as it is, has long remained a puzzle to baffle the physiologists and arouse the curiosity of the investigative-minded. Many theories have been devised to explain its occurrence, which have in general fallen into three groups: the hepatogenous, the hematohepatogenous and the hematogenous. Virchow did not differentiate between this form of jaundice and the catarrhal type, believing that both are due to a catarrhal swelling or plug, blocking the common duct. Others believed that bacterial influence played the important rôle, still others that it was due to circulatory changes. Ylppö concluded that there is a physiologic increase of bile secretion toward the end of the fetal period, which overflows into the general circulation.

Hematohepatogenous theories are based largely on the assumption that an increased destruction of red blood corpuscles in icteric infants causes the liver to produce an excessive amount of bile. Hematogenous theories were generally abandoned in 1866 when Minkowski and Naunyn were unable to produce icterus in geese with extirpated livers, thus giving rise to the maxim "no icterus without liver."

As a result of the discovery of the Van den Bergh reaction, however, by which minute quantities of bilirubin can be detected, the fact has been appreciated that icterus may be present without showing in the skin or in the body fluids. Goldbloom and Gottlieb (*Am. Jour. Dis. Child.*, 38:57 (July) 1929) have availed themselves of these tests to make new and ingenious investigations of icterus neonatorum which have enabled them to propose a new and logical theory for the existence of the condition.

They found, in short, that practically all samples of umbilical cord blood showed hemolysis in the serum. Increased fragility was also found in thirty-seven of thirty-nine samples of cord blood, and in nineteen of twenty samples of peripheral blood from new-born infants. An increase in nucleated and reticulated red cells was found in both cord blood and in the new born peripheral blood; an increase which rapidly disappeared, coinciding with the return of the fragility to normal. An increase of bilirubin was found in the cord serum and peripheral blood of all the infants examined. This icterus, whether or not visible, coincided in its development with the disappearance of the physiologic polycythemia of the new born.

The authors have apparently thus demonstrated that all infants have icterus, even if it is not grossly apparent; that it is hemolytic in origin; that it is due to hemolysis of the superabundant and fragile red cells which in part contribute to the polycythemia of the new born infant. "Why," they ask, "does the infant have a polycythemia?" In answer to this question they point out that the infant, except for a small portion of the umbilical vein, does not have pure arterial blood in his circulation. He lives in a constant condition of oxygen want and as a result the bone marrow is stimulated to an increased production of red cells. When respiration is established the necessity for a polycythemia ceases and the excess of cells is destroyed.

Such work is productive of thought; it brings to mind again the problem of hemorrhagic disease and the varying coagulability of the infant's blood, and the possible relationship between these factors and intracranial hemorrhage.

SUGGESTIONS WITH RESPECT TO THE PREVENTION OF CRIME

THAT the menace to and burden on Society of criminals is one of the greatest questions before humanity is generally recognized but the subject is so complex that no complete solution of the problems involved seems to be obvious. The more common approach has apparently been through defensive rather than preventive measures. As a general proposition the criminal establishes his status before he is recognized and classified.

Restrain and punishment seem to be the more general resources than prevention and cure.

Restraint is effective as far as keeping the enemy of society from the exercise of his predatory tendency is concerned provided that it is effective, but there is a very general suspicion that confinement accomplishes little in reforming character. Efforts have been made to cure the criminal of his abnormal mental behavior, but statistics seem to show that only a minority of convicted criminals ever demonstrate true moral reform. If this is so, the great army of police, the courts and the jails are mechanisms of defense more than agencies of cure.

Fortunately psychologists are taking on intensive studies of crime and the criminal. In an address before the symposium on legal psychology at New Haven, September 3, Professor Harry E. Barnes of Smith College suggested that "in any sound system of criminal procedure, the jury would completely disappear and would be replaced by a board of examiners, made up chiefly of psychiatrists and dominated by the psychiatric point of view. The judge would be reduced to the status of a formal supervision of the process as he is today in the examination of those suspected of insanity. This examining board would determine the method of treatment desirable in each individual case and present it to the judge for his formal approval."

This shows a feeling that court procedure as now conducted does not meet unqualified approval and implies the necessity of a scientific study of the psychology of the criminal and perhaps the writer intended to show, as has been contended, that most criminals are insane. Acceptance of this view depends upon the interpretation of the term insanity. Even here there is no concrete suggestion of prevention.

Professor Joseph Jastrow of New York in discussing this subject argued that the safest crime insurance would be found in the "relief of misery" contending that mental instability leads some persons only to misery but others to criminal tendencies.

Many suggestions have been offered from time to time of the possible causes of criminal behavior but there seems to be no clear cut program of prevention except in two directions: one the control of influences which are operative on the plastic mind of youth and the other the abolition of fertility among criminals and the mentally defective.

The first must be under the leadership of psychiatrists who will secure the co-öperation of parents and educators in the adoption of methods of instruction, and control over the habits and tendencies of children.

The second must be secured by legislation which will be sufficiently drastic to take from selected individuals the power and right of parenthood.

The first will be difficult of general application because those needing instruction of this sort will be least qualified to accept and adopt the recommendations of psychiatrists.

The second has and probably will meet obstruction on the part of sentimentalists but many states have adopted the policy of sterilization of the unfit.

We contend that rights of the majority far outweigh the desires of those unfit to bear normal children.

Life itself is subject to the exigencies of existence. Nations may decree that some shall sacrifice life for the safety of the whole people. Courts can condemn to death certain persons. Life is a major possession as compared to any one physical function. There is no sound logic in permitting the breeding of undesirable people. The sooner we adopt more drastic preventive measures there will come more general sanity and less crime. Actual and potential dangers to society must be eliminated as far as justice to all can be brought about.

Over thirty states in the Union have adopted laws more or less effective in control of the fertility of criminals and mental defectives.

Massachusetts should follow the example set by other states.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

MASON, WILLIAM. A.B., M.D. Harvard 1919. Physician to Truesdale Hospital and E. P. Charlton Surgery, Fall River, Massachusetts. He writes on: "Medical Co-öperation in the Management of the Surgical Case." Page 503. Address: 151 Rock Street, Fall River, Massachusetts.

SISE, LINCOLN F. A.B., M.D. Harvard 1901. Anesthetist, Lahey Clinic and New England Baptist Hospital; Consulting Anesthetist, New England Deaconess Hospital; Visiting Anesthetist, Lawrence Memorial Hospital of Medford. Address: 605 Commonwealth Avenue, Boston. Associated with him is:

WOODBRIDGE, P. D. A.B., M.D. Harvard 1921. Anesthetist to the Lahey Clinic. Address: 605 Commonwealth Avenue, Boston. They write on: "Choice of Anesthesia." Page 506.

POOL, EUGENE H. M.D. Columbia 1899. F.A.C.S. Attending Surgeon to the New York Hospital; Professor of Clinical Surgery, Columbia University. He writes on: "Post Operative Treatment." Page 510. Address: 107 East 60th Street, New York City.

LAHEY, FRANK H. M.D. Harvard 1904. F.A.C.S. Surgeon, New England Deaconess Hospital and New England Baptist Hospital; Director Surgery, Lahey Clinic. He writes on: "The Cystic Artery in Cholecystectomy." Page

522. Address: 605 Commonwealth Avenue, Boston.

MEIGS, JOE V. A.B., M.D. Harvard 1919. F.A.C.S. Surgeon to Out-patient Department, Massachusetts General Hospital and Palmer Memorial Hospital; Assistant Surgeon to Out-patient Department, Collis P. Huntington Memorial Hospital; Surgeon, Pondville Hospital at Norfolk and Vincent Memorial Hospital, Jamaica Plain; Non-resident Consulting Surgeon, Burbank Hospital, Fitchburg. He writes on: "Uterine Bleeding; an analysis of cases seen in the Tumor Clinic of the Massachusetts General Hospital." Page 525. Address: 264 Beacon Street, Boston.

FREMONT-SMITH, MAURICE. A.B., M.D. Harvard 1918. Instructor Harvard Medical School; Junior Visiting Physician, Boston City Hospital. He writes on: "Multiple Sclerosis—A Pitfall in Diagnosis." Page 531. Address: 264 Beacon Street, Boston.

MISCELLANY

THE THIRTEENTH INTERNATIONAL PHYSIOLOGICAL CONGRESS

(Continued from page 498, issue of September 5)

Dr. W. Cramer delivered an interesting paper on the "Functional Activity of the Adrenal Gland," demonstrating by lantern slides a method which gives evidence of the activity of the adrenal medulla. Previous methods of study were indirect and the data are either contradictory, or capable of different interpretations. Direct evidence of the functions of an endocrine organ can be obtained only by microscopic technique. In fact the conception of an internal secretion is at present based on a theoretical postulate and not on visual demonstration. Many claims of the secretory activity of the adrenal gland have not been accepted and the question has been raised whether the adrenal medulla does secrete adrenalin. A simple method has been worked out which renders visible by fixation in osmic acid vapor adrenalin as granules in the medullary cells of the resting adrenal. When the gland is stimulated to activity these adrenalin granules are seen to be expelled into the veins of the gland giving a clear visual demonstration of internal secretion thereby demonstrating facts which have a bearing on the mechanism of heat regulation and on the origin of fever: (1) The adrenal medulla is stimulated when there is exposure to cold. (2) Fever is produced by a stimulation of the gland which gives a continued adrenalinaemia. Sandiford, Boothby, and Cannon have confirmed these findings. The osmic vapor method has confirmed the secretion of adrenalin in asphyxia, and in ether anaesthesia, but has failed to confirm the secretion of adrenalin after insulin and in oxygen deficiencies, which has been postulated by means of the indirect method. By this "direct method" it is also possible to demonstrate a correlation between medulla and cortex, and the existence in the adrenal gland of a mechanism which serves to inhibit its functional activity.

Drs. Alfred E. Koehler and Lillian Eichelberger of Chicago declared that they had separated a new physiologically active principle of the Suprarenal Gland. This substance is free from epinephrin. It is capable of elevating the basal metabolic rate and promotes certain clinical asthenias.

Interesting findings were reported by Dr. J. M. Rogoff and Dr. G. N. Stewart of Cleveland in their study of the "Functions of the adrenal gland". It has been established that the function of the adrenalin secretion is not indispensable. The important function of the gland consists of the elaboration and probably secretion of a hormone by the cortex. In order to distinguish this hormone from adrenalin and to indicate its origin in the interrenal tissue they gave it the name "Interrenalin". They report prolongation of life in adrenalectomized animals when extracts of the adrenal were administered. Beneficial influence has been obtained, in a number of cases of Addison's disease, by administration of these cortical extracts. Leland C. Wyman of Boston studied the cortical and medullary factors in suprarenal insufficiency. He completed the following studies: susceptibility to histamine poisoning and to anaphylactic shock, levels of the blood sugar and blood non-protein and urea nitrogen, together with some observations on temperature regulation. The results led to the following conclusions: Increased susceptibility to histamine poisoning and to anaphylactic shock in the suprarenalectomized animals is not related to cortical insufficiency but is consequent to the lack of medullary tissue. Low blood sugar is characteristic of suprarenal insufficiency and is associated with cortical insufficiency. Following double suprarenalectomy the non-protein and urea nitrogen may be increased, the amount of increase tending to parallel the severity of the symptoms of cortical insufficiency. In the suprarenalectomized animals the fall of body temperature upon exposure to moderate cold and to inability to recover normal temperature rapidly is correlated with the degree of cortical insufficiency which is present. On the bases of these results and of those of other investigators it was suggested that the suprarenal cortex is concerned in the steady maintenance of certain bodily conditions, while the medulla brings about rapid adjustments in the same direction under emergency conditions.

Dr. Francis O. Schmitt, of the Kaiser Wilhelm Institute für Biologie, Berlin-Dahlem, Berlin, Germany, delivered a paper on the "Gaseous Metabolism of Nerves During and Following Anaerobiosis". He found that the oxygen consumption and the CO_2 production of nerves could be measured upon the same nerves. He confirmed the belief that nerves incur an oxygen debt in asphyxia. He also studied the effect of stimulation and of chemicals upon this debt. By refinement of technique, the respiratory quotient of the first hour of recovery respiration following anaerobiosis had been measured and found to lie between 0.65 and 0.75 or somewhat lower than the respiratory quotient of resting metabolism. The amount of CO_2 produced had been found for varying periods of rest and of stimulation in nitrogen.

Dr. R. K. S. Lim presented a paper on the metabolism of the stomach in association with Drs. S. M. Ling, W. C. Ma, T. G. Ni and T. C. Shen of Peping. The mitochondria-Golgi complex during secretory elaboration and discharge was first considered. It was found that in the peptic cells the secretion com-

ponent normally passes through a semi-solid phase, so called zymogen granules, before being discharged as a fluid, but after a prolonged stimulation of 12-24 hours, the peptic secretion may be discharged without granule formation. There was no storage or granule phase in the oxyntic cells. Next was considered the lipoid content of gastric juice and mucosa during secretion. The gastric juice contains, during secretion, lipoid of which not more than 10 per cent. is phospholipin; the lipoid output increases with secretion. The mucosa contains about three per cent. of lipoid of which less than half is phospholipin. After six hours' continued secretion, the total lipoid remains unchanged but the phospholipin fraction and the iodine number of both the P(202 to 369) and non P(182 to 251) fatty acids increase. The next point considered by Dr. Lim was the gas metabolism during secretion. The observations were made on a vivi-perfused stomach. The consumption of oxygen and carbohydrate is generally but not invariably increased during secretion. In the phlorhizinized or diabetic stomach, oxygen consumption follows a normal course during secretion, but carbohydrate intake is not increased and may be depressed. Neither of these conditions affects the ability of the stomach to secrete. Under resting conditions the oxygen intake does not usually suffice to oxidize all the carbohydrate, but during secretion there is an absorption of oxygen in excess over sugar. The respiratory quotient varies in the vivi-perfusion experiments; the mean value is below 1.0. In the early experiments on the mechanically perfused resting stomach, the respiratory quotient was found to be about 0.72. Evidence indicates that the mitochondria-Golgi complex is probably the source of the lipoid which is apparently oxidized during glandular metabolism.

Dr. Lester R. Dragstedt delivered a paper which was prepared in association with Dr. James C. Ellis of Chicago on the fatal effect of the total loss of gastric juice. The stomach was isolated by section at the cardia and pylorus. The duodenum was anastomosed to the lower end of the esophagus. The cardiac end of the isolated stomach was closed and the pyloric end brought to the surface as a fistula. The vagus nerves or blood vessels were not interfered with. Six dogs were prepared in this manner and observations made on the amount and quality of gastric secretion and accompanying changes in the blood chemistry. The following results were obtained: The total loss of gastric secretion from the body causes death in the dog in five to eight days with symptoms of weakness, anorexia, loss of weight, oliguria and profound depression. Accompanying these symptoms and proportionate to their severity there occurred a decrease in the concentration of blood chloride from 340 to 108 mgm., an increase in CO_2 capacity from 45 to 140 c.c., an increase in the PH from 7.3 to 7.75, and a terminal increase in non-protein-nitrogen from 27 to 180 mgm. and urea N from 12 to 154 mgm. The symptoms were relieved and the blood chemistry returned toward normal and life prolonged by the intravenous injection of 2000 to 3000 c.c. of Ringer's solution for 24 hours. In no case was life prolonged over 76 days. The isolated stomach, with intact blood and vagal supply, secreted in twenty-four hours from one thousand to two thousand cubic centimeters of gastric juice with a chloride concentration of 0.50 per cent. to 0.55 per cent. free HCl 0.45 per cent. and total HCl 0.50 per cent. The gastric glands can continue to secrete gastric juice of high, free and total acidity, even when the blood chloride has been reduced to less than a third of its normal concentration, an extreme alkalosis exists with plasma CO_2 104 and PH 7.70. Under these conditions, however, the volume of secretion is lessened from 300 to 500 c.c. for twenty-four hours. This is a continuous secretion, however, since the animal is depressed and refuses food. The ordinary stimuli for secretion are thus absent. When, as a result of alkalosis, hypochloremia, dehydration and absence of food taking, the volume of the juice is depressed, the intravenous injection of Ringer's solution causes a pronounced increase in secretion from 300 to 1500 c.c. per twenty-four hours, and this without the stimulus of food.

Dr. G. E. Burget and Dr. Karl Martzloff of Portland, Oregon, reported a study on a closed loop of jejunum. Dr. Burget stated that because of the limited period that animals have survived a high closed intestinal loop the symptom complex reported in the literature is complicated with the effects of absorption of toxins and peritonitis. A section of the jejunum 12 to 14 cm. long with its mesenteric vessels intact was closed by inversion of the ends and then attached to the anterior abdominal wall. Two stitches were placed in the skin to indicate the point of attachments of the loop. The continuity of the gastro-intestinal tract was re-established by an end-to-end anastomosis. The loop was tapped with a hypodermic needle at intervals of forty-eight hours for the first few days after which the intervals were longer. The pressure within the loop was thus kept down and good circulation permitted; by this means a normal mucosa was maintained. If no complications arise as the result of faulty technique, the clinical symptoms following the operation resemble closely those of an animal that has undergone only a simple intestinal anastomosis. Results indicate that first, toxic products of the loop are not absorbed; second, after ten to fourteen days the material either loses much of its toxicity or an immunity is developed or both factors play a part so that the loop does not produce critical symptoms. This work has a certain important bearing upon intestinal operations in humans for, if the findings are reliable, obstruction is better borne than has been supposed.

Drs. J. P. Quigley and A. J. Carlson of Chicago studied the influence of insulin on the motility of the gastro-intestinal tract. Dr. Quigley reported that gastric activity in normal men was recorded by the triple balloon method. In men fasting from 15-44 hours, 8-20 units of insulin produce a gastric response in 40-90 minutes. The response consists of one, a rise in tone; two, a series of rapidly repeated contractions usually more marked at the pyloric end of the stomach; three, an unusually prolonged hunger period, and continuous activity lasting five hours had been recorded. This activity was not depressed by smoking, mild nausea, pleasant or unpleasant emotions, bodily discomfort, taking food into the mouth or even the ingestion of one hundred grams of sugar, eighteen grams of dextrose and two hundred and fifty cubic centimeters of water. When cane sugar or dextrose was introduced into the duodenum or when atropine (0.5 mgm.) or epinephrin (0.5) were injected sub-cutaneously the activity was promptly inhibited. With each of these procedures a direct relationship was observed between gastric motility and hunger sensations. Two balloons in the duodenum and a balloon in the stomach demonstrated in

man that duodenal activity induced by insulin, parallels that noted in the stomach. As in the stomach, duodenal activity is inhibited by cane sugar introduced into the duodenum or by the subcutaneous injection of atropine. In normal dogs the gastric motility induced by insulin is likewise inhibited by the subcutaneous administration of atropine or epinephrin. In dogs with a Heidenhain pouch, insulin produces a decrease in motility of the pouch which parallels the increase in activity of the main stomach. Frequently the activity of the pouch can be increased by the intravenous injection of dextrose while the main stomach is showing depression. In dogs, having the vagi sectioned above the diaphragm insulin produces a depression of gastric motility. A pouch made of the pyloric end of the stomach with vagus fibers sectioned failed to respond to insulin. Motility of the dog's colon as recorded by a balloon introduced through a cecal fistula was increased by insulin and decreased by intravenous injection of dextrose in a manner similar to the normal stomach.

Drs. Fred M. Smith and George H. Miller of Iowa City made a study of the reflex influence of the colon on the stomach. According to Dr. Smith there is a considerable difference of opinion relative to the possible reflex influence of the colon on the stomach. Epigastric pains, nausea and vomiting are frequently associated with chronic colitis. Clinicians and roentgenologists have been inclined to attribute these symptoms to a disturbed motor function of the stomach induced by a reflex stimulation from the colon. The studies have led to varying conclusions. In the investigation carried on, dogs anesthesized by barbital were employed. A midline incision was made in the upper abdomen which permitted exposure of the stomach and proximal colon. The stomach was filled with warm water and the activity observed during a control period. An irritant, such as croton oil or turpentine, was introduced into the proximal colon, or air was introduced to cause moderate distention. They took precautions to prevent the irritant coming in contact with the ileum. Following the distention or the introduction of the irritant into the colon, there was usually a marked increase in the activity of the stomach. The peristaltic waves were much more frequent, deeper and, at times, very violent. During the height of the increased activity, reverse waves were often noted. The increased activity of the stomach induced by the stimulation of the colon was abolished by atropine.

Studies on a hormonemechanism for gall bladder contraction and evacuation by Drs. A. C. Ivy, Eric Oldberg, Grant Kolster and H. C. Lueth were reported. They showed in a previously published article that an extract of the upper intestinal mucosa free of vaso-dilatin, on intravenous injection, causes the gall bladder to contract and evacuate. It was also found that cross-circulation experiments yielded positive results for a hormone mechanism. When acid was placed in the duodenum of one animal the gall bladder of both animals contracted. Its action is abolished by deep anesthesia and low blood pressure, and they have not been able to cause the gall bladder to contract in vitro by applying solutions of the active principle. They have observed by direct vision, the gall-bladder in situ to contract on injection of the active principle. Under its influence the gall bladder of the cat, dog, and guinea pig contracts, but not the gall bladder of the rabbit. It has no effect on the gastric musculature. Its action on the intestinal musculature is variable. They have called the active principle cholecystokinin.

Drs. Noel F. Shambaugh, J. D. Doty and Cyrus C. Sturgis of Ann Arbor, Michigan, reported a comparison of the toxicity of cystine, tyrosine and phenylalanine. They gave white rats on a basic diet per os administrations of cystine, tyrosine and phenylalanine by oesophageal catheter. Two daily doses of such amounts were given that a total of three milligrams per gram of body weight was received daily by each animal. The amino acids were to some groups given unneutraiized, suspended in physiological sodium chloride solution. To other groups the substances neutralized by the theoretical amounts of sodium hydroxide were given in physiological saline solution. The animals were sacrificed after five, ten and in some instances fifteen days. Both kidneys and a portion of the liver tissue were removed for examination. Cystine was found to produce the greatest degree of damage both hepatic and renal. The renal damage occurred principally in the tubular areas. The hepatic pathology consisted of perilobular fibroblastic proliferation as well as retrograde changes in the parenchyma. Tyrosine produced damage principally to the renal glomeruli in contrast to the tubular damage by cystine. The liver changes with tyrosine though definitely present, were less marked than those observed following cystine administration. The pathology in the liver and kidney after large doses over short time periods was found to be intermediate in contradistinction to that following cystine and tyrosine administration.

Drs. C. H. Best and E. W. McHenry of Toronto studied the inactivation of histamine. They reported the results of further work on the in vitro inactivation, of naturally occurring and added histamine, by lung tissue. The new experiments dealt with optimum temperature and hydrogen-ion concentration of the action of the factor present in minced lung. Various tissues from different animals have been studied to determine the distribution of this histamine-inactivating property in the animal body. They also discuss the preparation and purification of the extracts containing the active factor.

Drs. Soma Weiss, Lawrence B. Ellis and George P. Robb of Boston studied the bodily responses in man during the continuous intravenous administration of histamine. During recent years fundamental physiologic and pathologic significance has been attributed to the rôle of histamine in circulatory regulation. Dr. Weiss stated that as far as man is concerned direct evidence of such function of histamine is still lacking. The response of the cardiovascular system to the intravenous injection of histamine was instantaneous. The average minimal dose which was just sufficient to produce the earliest circulatory changes was 0.0003 mgm. per minute of a solution 1:100,000. The concentration of this minimal effective dose of histamine in the circulating blood is one to twenty billion parts. Adult individuals tolerated with marked circulatory reaction the continuous intravenous administration of 0.02 to 0.04 mgm. of histamine per minute of a solution of 1:10,000.

With uniform injection the observed bodily changes were practically stationary. Histamine is destroyed almost as rapidly as it enters the blood. Histamine under the condition described produces usually a dilation of the arterioles and capillaries of the skin and of the brain, with simultaneous marked dilation of the venules. The dilator effect of histamine on

the small veins is independent of its effect on the arterioles and it may be present without change in the arterioles and capillaries. Even in the presence of marked systemic response blood pressure shows no appreciable drop in most instances. Occasionally definite rise or fall in blood pressure is observed. The heart rate, cardiac output, velocity of blood flow, pulmonary ventilation and body metabolism are increased. The marked response of the heart with increased output is probably responsible for the lack of fall in arterial pressure. Appreciable contraction of the bronchioles is not present. The total blood volume is not changed, but the distribution of the arterial and venous blood volume is shifted so that the blood in the venous system is increased. Epinephrin in a ratio of 1:30 antagonizes the effect of histamine on the cutaneous and cranial vessels. The epinephrin histamine antagonism varies for different functions affected by histamine. The bodily changes thus observed during the administration of histamine are not identical with those observed on patients in shock.

Dr. J. M. LeGoff of Paris presented a new subject in treating of Cobalt as a vasodilator. Recently small amounts of cobalt have been found in animal tissues, and also in commercial solutions of insulin: 2.64 mgm. in the spleen and 2 mgm. in the pancreas, in one kilo of dried material. The hypodermic or intramuscular injection of 2 to 5 centigrams of the same compound in human subjects is followed immediately by a redness of the face and ears, lasting for 10 to 15 minutes. It is remarkable that Dr. LeGoff did not get the redness after an injection of the same amount of nickel chloride. This instantaneous redness of the face seems to be produced by the selective effect of cobalt acting as a possible reagent on the sympathetic system. This striking redness can be obtained also with many organic compounds of cobalt such as salicylate, citrate and even cobaltamine. At the same time a fall in the blood pressure can be recorded.

Dr. M. S. Dooley presented a paper in association with Dr. C. J. Wells of Syracuse, New York, on the circulatory, respiratory and other reflexes induced by inhalation of irritant anesthetics. They demonstrated that a comparison of the volatile anaesthetics shows that only the irritant types induce the following marked primary changes in inhalation, inhibition of respiration, heart activity, vasoconstriction, salivation even when kept from contact with the mucous membranes of the nose, mouth, pharynx and larynx, dilation of pupil even when applied only to the upper part of the respiratory tract, i. e., from the lower limit of the larynx upward. The non-irritant types locally applied induce none of these effects. An important phase of the vasoconstriction is that of the spasm of the renal vessels, sometimes of long duration. This leads to anuria which may be permanent even though recovery of normal kidney volume may be re-established. A more crucial test of the reflex nature of the kidney vessel spasm is that amylnitrite, a drug known to dilate these vessels on direct contact, constricts them as readily as does ether when applied to the upper part of the respiratory tract. This reflex effect on the kidney may account for the so-called "ether anuria" encountered clinically. Double cannulation of the trachea was the only unusual technical procedure used, the upper of the two directed upward to facilitate the application of gases to the upper part of the tract. The findings in this work would seem to account for some of the familiar after-effects of anaesthetics.

Dr. G. H. W. Lucas of Philadelphia and Dr. V. E. Henderson of Toronto reported the effects of cyclopropane as an anaesthetic. Cyclopropane is an anaesthetic gas which was made during a study of the possible sources of toxicity in propylene. According to Papin and Ambard, cyclohexane has anaesthetic properties. Cyclopropane produces anaesthesia of surgical degree in cats in a concentration of eleven per cent. in oxygen. For induction about fifteen per cent. may be used for a minute or two. Anaesthetization is rapid with little or no struggling and recovery takes place almost equally rapidly. With anaesthetic concentrations the blood pressure rises slightly or remains normal, respiration is of a normal rate and depth. Twenty-five per cent. or more causes a decrease in blood pressure and in respiration both of which are transitory if the anaesthetic is removed. Animals have been anaesthetized on three successive days for periods of two hours without showing any apparent toxic effects. The gas as prepared is mixed with eight per cent. of a combination of hydrogen and hydrocarbon.

Drs. J. A. Waddell and G. T. Gwathmey Jr. of Charlottesville, Virginia studied the effect of magnesium salts per rectum in rats, rabbits, cats and guinea pigs. Expulsion was prevented by clamping or ligating the anal canal. Solutions of the various salts were prepared to contain in equal volumes equivalent amounts of magnesium. The concentrations used were from eight to thirty per cent. in the case of the chloride, or the equivalent where other salts were administered. The chloride, acetate, nitrate, ethyl-sulphate, sulphate and benzoate were readily absorbable. The effects were dependent on the dosage: somnolence, anesthesia, coma and respiratory death. The slightly soluble citrate and lactate were ineffective. Study was made on the influence, the total quantity of magnesium; second, the concentration of its solutions, and third, the anion of its salt. The effects of a specific salt were not proportionate to the quantity of magnesium administered. Even a very slight change in the strength of a solution markedly altered the response e.g. 0.1178 gm. of magnesium as chloride in eight per cent. solution was ineffective but in 12 per cent. anaesthetic. The margin of safety between the anaesthetic and fatal doses progressively decreased with the concentration. The effect of different salts was not proportionate to their content of magnesium. Each required a different total quantity of magnesium and a different optimal concentration, e.g. to produce anaesthesia 0.0883 gm. of magnesium as benzoate was effective in nine per cent. suspension, but not less than 0.1178 gm. as chloride in 12 per cent. solution and 0.1478 gram as sulphate in twenty-nine per cent. solution. In comparing the different salts, consideration must be given not only to the quantity of magnesium but also to the optimal concentration and to the anion. The efficiency of magnesium was promoted by admixture with certain substances e.g. sodium benzoate and by dryness of the feces and impaired by diarrhea and diuresis.

Dr. M. M. Kunde of Chicago in presenting his study of the basal metabolic rate in experimental cretinism and myxedema stated that the basal metabolic rate of dogs thyroparathyroidectomized in the puppy or adult stage is lower than that of normal

dogs only in those animals showing other symptoms of thyroid deficiency. Incomplete control of the parathyroid tetany masks all effects of the thyroid deficiency on the basal metabolism.

The antagonistic effect of thymus on the action of thyroid in reducing body weight was investigated by Dr. Jaroslav Krizenecky of Cold Spring Harbor, Long Island. Experiments done previously on pigeons showed that the decrease in body weight produced by dry thyroid substance administered per os can be reduced to about one-half by the simultaneous administration of dry thymus substance. This effect was thought to be due to hormonal antagonism of thymus against thyroid. To determine whether nucleic acid rather than thymus hormone was responsible for this antagonism the following tests were made on doves. Five groups were dosed daily:

(1) Control Group: 0.3 gram peptone in glycerin in emulsion.
(2) Thyroid group A: 0.1 gram thyroid + 0.2 gram peptone in glycerin emulsion.
(3) Thyroid group B: 0.2 gram thyroid in gelatin capsules.
(4) Thymus group: 0.2 gram thymus + 0.1 gram peptone in glycerin emulsion.
(5) Thymus + Thyroid group A: 0.1 gram thyroid + 0.2 gram thymus in glycerin emulsion.
(6) Thymus + Thyroid group B: 0.2 gram thyroid + 0.4 gram thymus in gelatin capsules.
(7) Nucleic acid group: 0.015 gram nucleic acid (obtained from spleen) + 0.3 gram peptone in glycerin emulsion.
(8) Thyroid + nucleic acid group: 0.015 gram nucleic acid + 0.1 gram thyroid + 0.2 gram peptone in glycerin emulsion.

The duration of the experiments was thirty-four days.

The results showed a decrease in all. In (1) the control group, an average decrease in body weight of four per cent. In (2), thyroid group A, of nineteen per cent. In (3), thyroid group B, of twenty-two per cent. In (4), thymus group, of six per cent. In (5), thymus + thyroid group A, twelve per cent. In (6), thyroid + thymus group B, of ten per cent. In (7), nucleic acid group, of ten per cent. In (8), thyroid + thymus nucleic acid group, a decrease of twenty-seven per cent.

A study on the excretion of calcium through the intestines in parathyroidectomized animals by Drs. N. B. Taylor and A. Fine of Toronto was reported. Macallum and Voegtlin, Salvesen, Hastings and McIntosh have investigated the calcium excretion through the intestines in tetany. However in previous experiments the excreted calcium was estimated in feces of animals placed upon a diet of constant calcium content. Since differences in excretion of normal and parathyroidectomized animals was not to be expected, methods dependent upon the estimation of the calcium of the feces would possess an error which would obscure results. Taylor and Fine used a method which was a modification of the method used by Stewart and Percival by which a portion of the intestine was washed out until calcium free, thereby securing accurate results. The excretions in normal and parathyroidectomized animals were compared after the injection of 60 mgm. of calcium intravenously. The general procedure was to open the abdomen and tie cannulae into the lumen of the bowel immediately below the pylorus and just above the ileocolic sphincter. The bowel was then flushed out with 600 c.c. of calcium free saline until the final 100 c.c. contained no trace of calcium. The cannulae were enclosed by rubber caps, the bowel replaced within the abdomen and the animal allowed to recover from the anesthetic. From three to six hours later the abdomen was re-opened under an anesthetic and the bowel flushed out until the washings were again calcium free. The total calcium of the washings was again estimated. After removing all extraneous debris, it was found advisable to acidulate the fluid in order to make soluble any calcium salt. In the normal animals the amount of calcium excreted by the bowel was very small, never more than 1 mgm. and usually much less. In the parathyroidectomized animals the excretion was very much greater. The maximum excretion in the series of animals operated upon was 10 mgm. and the minimum 3.4 mgm.

Drs. Joseph C. Aub, Walter Bauer and Fuller Albright of Boston studied the influence of the thyroid and parathyroid glands upon inorganic salt metabolism. Three persons were studied. (A) A normal man who was given sufficiently large doses of parathyroid extract to raise the blood calcium level to 12.5 mgm. per 100 c.c. (B) A myxedematous woman who was given enough thyroid extract to raise her basal metabolism rate to normal. (C) A woman with exophthalmic goiter who was cured by the removal of her thyroid. The calcium, phosphorus and total bases were determined in excreta and the urine analyzed for sulphur, chlorine and titratable acidity. The three subjects received the same food, deficient only in calcium. Comparison of the effects of the varying conditions of their inorganic salt metabolism was easy. Daily injections of 100 units of parathormone raised the blood calcium level to 12.5 mgm. per 100 c.c., lowered the blood phosphorus level, and increased the urinary calcium and phosphorus excretion. Thyroid administration greatly increased excretion in the myxedematous case without affecting the blood calcium level. The exophthalmic goiter patient excreted 300 per cent. more calcium than normal. The effects of these internal secretion variations upon other factors of inorganic salt metabolism were surprisingly slight, and the variations that did occur were in large part due to changes in the nitrogen balance. Thus, the changes in fixed base metabolism are largely adjustments derived from the bone salts.

Dr. Harold M. Teel reported study by Dr. Harvey Cushing and himself which concerned the hypophyseal (pars distalis) hormones for growth and for reproductive processes. By the injection of anterior lobe extracts on dogs they confirmed the recent work on rats and mice, done by Evans and Smith, who have proved the existence of two distinct hormones. The growth principle was first investigated. Intraperitoneal injections in dogs caused in time a pathological overgrowth with splanchnomegaly, hyperplasia of thyroid and adrenal cortex. The following symptoms were present: polyphagia, polydipsia, polyuria, sialorrhea, lactation, asthenia and physical activity. In females the genitalia became enlarged in the absence of estrus; in males, testicular atrophy occurred and libido was diminished. Chemically, no elevation of the basal metabolic rate had been demonstrated. Blood cholesterol had a tendency to be

elevated. There was no observable change in serum protein, in calcium, phosphorus or sugar.

The sex principle was next investigated. The boiled dilute acetic acid extracts of fresh anterior lobes of bovine glands, made according to Spaul's method, brought about premature estrus in twenty-six day old female rats. The ovaries enlarged, though to a less extent than the enlargement produced by Smith's method of introducing living anterior lobe transplants. Not all extracts produced by this method have proved to be active but the results make it evident that the sex principle may sometimes be present in acid extracts which invariably destroy the growth principle.

Report on the redistribution of water between internal and surface tissues and the blood at the height of morphine withdrawal, was submitted by Drs. H. C. Barbour, B. E. Russel, S. H. Flowers, E. S. Dunham and L. G Hunter of Louisville, Kentucky. Morphine addiction when well advanced tends to dehydrate certain internal organs, viz.: liver, kidney, brain. On the other hand the skin, stomach, intestines, blood and spleen tend to show hydration. The volume of water ingested and excretion of urine is always low. Upon sudden withdrawal of morphine, redistribution of water results. The effects are pronounced during the first day, accompanying the characteristic muscle tremors and diarrhea. Internally, edema of the brain, with lipoid loss in some parts, and edema of muscles, liver and kidneys occurs. The pericardial fluid increases. Blood, serum, spleen and surface tissues all show a loss. Environmental water exchange is greatly increased. When the latter subsided early, the withdrawal edema also ceased, the dehydrated surface tissues and blood remaining dry. When the high environmental exchange continued, the blood soon began to show hydration. Five female dogs, five months old, were employed. Four were addicted; three of these had the same balanced ration as the control unmorphinized dog; two dogs were withdrawn after five weeks. All were quickly killed with KCN. In other dogs internal tissues were repeatedly sampled under local anesthesia. The results appear unrelated to nutrition. Ingestion was constant. Nitrogen absorption was nearly complete under both addiction and withdrawal. Like tetany, morphine withdrawal showed: muscle tremors, inco-ördination, decreased blood calcium, edema of brain, liver and kidneys, anhydremia, diarrhea and disturbed temperature regulation. Especially significant is the degree of brain edema sufficient to produce psychic symptoms.

"Diffusion through the walls of surviving intestine" was studied by Drs. H. E. Magee and J. J. R. MacLeod of Aberdeen, Scotland. They found that solutions of substances such as acids, potassium iodide and the sugars when placed in loops of living intestine immersed in Tyrode's solution, diffuse out more slowly than through intestine that has been killed by heat or sodium fluoride. Although this difference may depend to some extent on a change in physical structure of the wall, due to coagulation of protein, the possibility exists that the function of selective absorption of the living mucosa could be demonstrated and its properties investigated by this method. To study this possibility the following tests were performed: (A) The rates of diffusion of equimolecular solutions of various pentoses and hexoses. In general, it was found that the hexoses diffuse much more rapidly than the pentoses. (B) The rates of diffusion of the same substances at varying temperatures are considerable. Within certain limits, the rate of diffusion is much less dependent on the concentration in living than it is in dead intestine. This method offered a means for studying the action of such enzymes as the invertases. Practically no cane sugar was found to diffuse out in living intestine but diffusion rapidly occurred when it was killed.

(To be Continued)

DR. W. G. LENNOX READS A PAPER BEFORE THE COLORADO STATE MEDICAL SOCIETY

On Wednesday, September 4, Dr. W. G. Lennox of Newton, Massachusetts read a paper before the Colorado State Medical Society entitled "Recent Studies in Epilepsy".

Dr. Lennox is Research Fellow in Neuropathology at the Harvard Medical School. The abstract of his paper as it appeared in the program is as follows:

Epilepsy is considered a symptom. As with the study of any symptom—headaches for example—there are two main avenues of approach. First, the detailed examination of patients to determine the individual abnormalities which might directly or indirectly cause seizures. Study so far has failed to disclose any single abnormality common to all patients having seizures. The second approach is the study of the physiology of seizures; the influence of conditions which tend either to precipitate or to retard their appearance. Changes in the acid base equilibrium of the body, in the oxygenation of tissues, in the concentration of certain chemical constituents definitely modify the frequency of seizures. Certain therapeutic applications of these observations are suggested.

WEEKLY HEALTH INDEX

SUMMARY

Telegraphic returns from 63 cities with a total population of twenty-nine million for the week ending Aug. 31 indicate a mortality rate of 10.7 as against a rate of 11.1 for the corresponding week of last year. The highest rate (20.0) appears for Birmingham, Ala., and the lowest (6.6) for Somerville, Mass. The highest infant mortality rate (129) appears for Nashville, Tenn., and the lowest for Fall River, Mass., Kansas City, Kans., Portland, Ore., Spokane, Wash., and Waterbury, Conn., which reported no infant mortality.

The annual rate for 63 cities is 13.5 for the thirty-five weeks of 1929, as against a rate of 13.2 for the corresponding weeks of 1928.

RECENT DEATHS

MORSE—DR. HENRY LEE MORSE, retired otologist, of Boston, died at his home in Medfield after a long illness, September 7, 1929, aged 76.

He was born in Boston November 18, 1852, had an A.B. from Harvard in 1874 and an M.D. in 1878, having completed a service as house officer at the Massachusetts General Hospital.

In his later years, Dr. Morse was consulting aurist to the Massachusetts General and Children's hospitals and previously aural surgeon to the Massachusetts Charitable Eye and Ear Infirmary.

In 1924, Dr. Morse, although in poor health, at-

tended the fiftieth anniversary of his college class at Cambridge.

HARTUNG—Dr. Harry Hall Hartung, medical examiner for the Boston office of the Aetna Life Insurance Company, died at his home in Boston, September 4, 1929, aged 54, after an illness of a year and a half.

A native of New Haven, Connecticut, he was a graduate of Yale University School of Medicine in 1896. After taking post-graduate courses in Berlin and Munich he settled in practice in Boston. He was surgeon major in the Massachusetts volunteer militia and served as instructor in first aid to the Metropolitan police and to the Boston police departments. He was a Mason and an Odd Fellow and held membership in the Massachusetts Medical Society, the American Medical Association and the Association of Military Surgeons of the United States.

While studying in Germany Dr. Hartung married Crescentia Baumilia. She and a son and daughter survive him.

COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1928 AND SEVEN YEAR AVERAGE MONTH ENDING AUGUST 31, 1929

DISEASES	1929					1928			
	Wk. ending Aug. 10	Wk. ending Aug. 17	Wk. ending Aug. 24	Wk. ending Aug. 31	Average cases reported for week corresponding to Aug. 31 for past seven years	Wk. ending Aug. 11	Wk. ending Aug. 18	Wk. ending Aug. 25	Wk. ending Sept. 1
Anthrax	-	-	-	-	-	1	-	-	-
Cerebrospinal Men.	2	1	-	2	-	-	3	1	2
Chickenpox	9	14	6	21	4	5	1	4	1
Diphtheria	16	15	9	11	18	11	7	9	10
Dysentery Bacillary	-	-	1	-	2	-	3	-	-
Encephalitis Epid.	-	-	-	1	-	1	-	-	1
Favus	-	1	-	-	-	-	-	2	-
German Measles	13	-	1	-	1	4	-	-	3
Influenza	-	4	-	2	2	2	2	1	5
Malaria	-	-	-	1	1	-	1	-	-
Measles	11	8	17	1	10	39	19	11	13
Mumps	5	2	-	5	4	7	7	10	9
Paratyphoid Fever	-	-	-	3	-	-	-	1	1
Pneumonia (Broncho)*	14	6	7	6	12	12	5	7	14
Pneumonia (Lobar)	9	1	7	4	7	7	5	7	15
Poliomyelitis	2	-	2	2	6	3	5	2	4
Scarlet Fever	16	7	7	8	14	7	5	4	7
Septic Sore Throat	-	1	-	-	3	-	-	-	2
Tetanus	-	-	-	-	-	-	-	1	-
Trachoma	-	1	-	-	-	-	-	-	-
Tuberculosis (Pul.)	14	40	22	23	27	33	29	20	26
Tuberculosis (O.F.)	3	2	4	2	3	5	7	1	5
Typhoid Fever	5	3	5	4	7	2	7	6	4
Undulant Fever**	-	-	-	-	-	-	-	1	-
Whooping Cough	13	18	28	21	37	78	44	53	25
Gonorrhoea	31	30	25	17	29	38	22	31	28
Syphilis	26	14	32	42	31	31	29	21	63

* Made reportable January 1, 1925.
** Made reportable July 1, 1928.

REMARKS: No cases of Asiatic cholera, Glanders, plague, rabies in humans and Yellow fever during the past seven years.

CORRESPONDENCE

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Ill.,
August 30, 1929.

Managing Editor,
The NEW ENGLAND JOURNAL OF MEDICINE:

Dear Doctor:

In addition to the articles enumerated in our letter of July 29, the following have been accepted:

Abbott Laboratories
Abbott's Viosterol Cod Liver Oil

Ciba Co., Inc.
Atoquinol—Ciba
Vioform—Ciba

Eli Lilly & Co.
Inhalant Ephedrine (Plain)—Lilly
Hypodermic Tablets Ephedrine Hydrochloride—Lilly, 0.016 Gm. (¼ grain)
Hypodermic Tablets Ephedrine Hydrochloride—Lilly, 0.0325 Gm. (½ grain)
Hypodermic Tablets Ephedrine Sulphate—Lilly, 0.016 Gm. (¼ grain)
Hypodermic Tablets Ephedrine Sulphate—Lilly, 0.0325 Gm. (½ grain)
Lilly's Ephedrine Jelly
Ointment Ephedrine Compound
Syrup No. 110 Ephedrine Sulphate
Syrup No. 111 Ephedrine Sulphate

Mead Johnson & Co.
Mead's Powdered Lactic Acid Milk, Non-Curdling No. 1 with Dextrose

Yours truly,
W. A. PUCKNER, *Secretary*,
Council on Pharmacy and Chemistry.

NEWS ITEMS

THE LEARY LABORATORY—Dr. Timothy Leary, Dr. Olga C. Leary, Dr. Frank H. Dunbar, and M. Margaret Fritz, A.B., are conducting a pathological and clinical laboratory under the above designation at 43 Bay State Road, Boston.

AMERICAN CHILD HEALTH ASSOCIATION ANNUAL MEETING—The American Child Health Association will hold its sixth annual scientific meeting in Minneapolis, September 30 to October 5. For further information concerning the meeting write to Homer Calver, Executive Secretary, 370 Seventh Ave., New York City.

At the same time and in the same city will be held the meetings of the American Public Health Association, the American Association of School Physicians, and the American Social Hygiene Association.

REMOVALS

The following physicians have moved their offices to 319 Longwood Avenue, Boston:

Dr. Robert C. Cochrane from 86 Bay State Road
Dr. G. Philip Grabfield from 23 Bay State Road
Dr. Albert A. Hornor from 86 Bay State Road
Dr. James H. Townsend from 86 Bay State Road
Dr. Edwin T. Wyman from 483 Beacon Street.
Dr. Randolph K. Byers, from 66 Commonwealth Avenue
Dr. Charles C. Lund, from 527 Beacon Street
Dr. Fred B. Lund, from 527 Beacon Street
Dr. Edward S. Emery, from 520 Commonwealth Avenue
Dr. Paul Gustafson, from 475 Commonwealth Avenue
Dr. Augustus Thorndike, Jr. from 66 Commonwealth Avenue
Dr. W. Richard Ohler from 270 Commonwealth Avenue.

Dr. William B. Davidson announces the opening of an office at 36 Pleasant Street, Worcester.

REPORTS AND NOTICES OF MEETINGS

REPORT OF THE ELEVENTH CONGRESS OF THE INTERNATIONAL PSYCHOANALYTICAL ASSOCIATION

The eleventh Congress of the International Psychoanalytical Association was held at Oxford from July 27 to July 31, 1929 inclusive. There was a large attendance from Austria, Germany, France, Switzerland, India, Hungary, England and the United States, representing the various constituent National societies.

The Congress opened on the evening of July 26 with a reception given by the British Psychoanalytical Society to members and guests, in the Hall of Queens' College, by the courtesy of the Provost and Fellows. Among other entertainments, there was a day set apart for excursions to various points of historical and architectural interest. In addition to the regular scientific program there were informal discussions on training for analysis, on the termination of an analysis and also on the question of child analysis.

The papers of the scientific program comprised various contributions in the technical, theoretical and clinical fields of psychoanalysis. A few of the subjects discussed were the limitations and potentialities of the technique of psychoanalytic therapy, instinctual mechanisms in the neuroses, psychosexual frigidity and impotence, paranoia, neuroses in children, progress in analytical therapy, fetichism, neurotic anxiety, ego psychology, and morbid drug cravings.

At the close of the meetings it was decided to hold the twelfth Congress in Switzerland in 1931.

FRANKLIN DISTRICT MEDICAL SOCIETY

The September meeting of the Franklin District Medical Society was held at the Weldon Hotel, Greenfield, Tuesday, Sept. 10, 1929, at 11:00 A. M.

Program:

Some Observations and Report of a Case of Malta Fever. Dr. A. W. Wright, Northfield.

Report of the Annual Meeting of the A. M. A. at Portland. Dr. H. G. Stetson, Greenfield.

The Four Cardinal Principles of Health. Dr. M. M. Brown, North Adams.

Report of a Case of Tetanus. Dr. K. N. Rice, South Deerfield.

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The monthly clinical conference of the New England Hospital for Women and Children will be resumed at the hospital, Dimock Street, Roxbury, on Thursday, September 19, at 8 P. M. The following cases will be reported:

Pneumococcus meningitis; Puerperal sepsis (four cases); Diabetes complicated with gangrene; Streptococcus infection resulting in erysipelas.

ALICE H. BIGELOW, M.D., *Secretary.*

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

September 19—New England Hospital for Women and Children. Detailed notice appears above.

September 27-28—New England Surgical Society. Detailed notice appears on page 1227, issue of June 6.

October 7-19—New York Academy of Medicine. Detailed notice appears on page 468, issue of February 28.

October 13-18—General meeting of the International Society of Medical Hydrology and International League for Combating Rheumatism. Detailed notice appears on page 288, issue of August 8.

October 21, 22, 23, 24, 25—International Assembly of the Inter-State Post-Graduate Medical Association of North America. For detailed notice see page 341, issue of August 15.

November 4, 5, 6 and 7, 1929—Clinical Congress and Eighth Annual Meeting of the American College of Physical Therapy. See page 149, issue of July 18, for details.

December 2-6—The Radiological Society of North America. Complete notice appears on page 149, issue of July 18.

May 5-10, 1930—First International Congress on Mental Hygiene. See page 191, issue of July 25, for details.

DISTRICT MEDICAL SOCIETIES

Bristol North District Medical Society

The Fall Meeting will be held at the Tavern, Mansfield, on Thursday, September 19, at 1 P. M.

J. L. MURPHY, Secretary.

Franklin District Medical Society

The meetings of the Franklin District Medical Society will be held at the Weldon Hotel, Greenfield, Mass., on the second Tuesdays of November, January, March and May, at 11 A. M.

CHARLES MOLINE, Secretary.

Middlesex East District Medical Society

October—Joint meeting with Middlesex North and Essex North and South.

November 13—At Reading.

January 15—At Boston, Harvard Club.

March 12—At Melrose.

May 13—At Unicorn Country Club.

ALLAN R. CUNNINGHAM, Secretary.

Norfolk District Medical Society

Schedule of meetings for the year 1929-1930. Invitations have been sent to the speakers and the list is true only on condition of their acceptance.

October 29—Medfield State Hospital, Harding, Massachusetts. Papers by the Staff.

November 25—Roxbury Masonic Temple. Dr. Roger Graves, "Urology from the Standpoint of the General Practitioner." Surgical discussion. Medical discussion.

January 27, 1930—Roxbury Masonic Temple. "Recent Advances in Diagnosis and Treatment of Syphilis." Speaker to be announced.

February 24, 1930—Roxbury Masonic Temple, 8:00. Dr. Edwin H. Place has been invited to read a paper and has been given carte blanche in the selection of his subject.

March 24, 1930—Roxbury Masonic Temple. Dr. Burton E. Hamilton. Subject to be announced.

May 6, 1930—Annual Meeting. Program to be announced.

The Censors meet for the examination of candidates, November 7, 1929, and May 1, 1930, in the Roxbury Masonic Temple, 171 Warren Street, Roxbury, at 4:00 P. M. Applications must be in the hands of the Secretary at least one week previous to date of examination.

Owing to inability to engage the Roxbury Masonic Apartments on the last Tuesday of the month, such meetings as will be held in the Roxbury Temple will be held Monday evenings as per the dates above.

FRANK S. CRUICKSHANK,
Secretary, Norfolk District Medical Society.

BOOK REVIEWS

The Nose, Throat and Ear and Their Diseases. By CHEVALIER JACKSON and GEORGE M. COATES. Published by W. B. Saunders Company. 1929. Price $13.00.

We have been anticipating the publication of this book. Its review has been a pleasure. To give an adequate description would be to present the book itself. Space will only permit a superficial comment, which may however serve to stimulate interest and urge its addition to the reader's library.

The arrangement is unique in this regard:—it has been written by many authors, not by a few. In the front of the book appear the names of seventy-four men who have contributed. This list might almost be called the "who's who" in otolaryngology. Drs. Jackson and Coates have decided what should appear in such a text-book, have divided it into definite subheads, and then have gone to the leading authorities, not only in the United States, but in Canada and in Europe, and have secured them as the individual contributors on the subjects in which they are recognized as authorities. The assembly of such a vast amount of material and its arrangement into a consecutive story, well illustrated, is a monumental piece of work. The result is an 1131 page standard sized text-book but with this added virtue, that it will serve not only the beginner but the advanced student. The trained otologist has had to seek for more recent results of research, in the medical magazine and the medical society transactions. Here these same writers have summarized their observations and we find them gathered under one cover, with references at the end of the chapter permitting us to go into more detail, if we so desire. Some may find it a disadvantage to discover diverging opinions in the same book:—one form of local medication is recommended on one page and is found objectionable a few chapters later; one author will advise operative interference in a given case and another takes a contrary opinion. This may prove confusing to the beginner but it is stimulating to the advanced student whose personal experience affords a background to guide him; and the care with which the subjects have been allotted by the authors, together with the restraint practiced by those writing each article, make for very little crossing of opinions. The authors cite this difficulty in their preface and call attention to the advantages such differing opinions offer the reader. In an elaborate index, they refer the reader to these different authors in order to point impartially to the leading opinions now being held on these muted points.

The first chapter opens with an article by Prof. J. Parsons Schaeffer of Jefferson Medical College, on the anatomy of the nose. There is no greater authority. Here in forty pages, beautifully illustrated, we have a summary of this man's abundant work and writings. Ingersoll then discusses diseases of the nose; Sewall takes up the septum; Faulkner reviews sinus complications and their surgery; Emerson dwells particularly on antrum troubles; Coffin follows by taking up antrum troubles in children in

which he has so long been interested; Leon White dwells on ocular complications in which he became an authority; and Harry Barnes discusses neoplasms of the sinuses. A little later I. C. Walker takes up asthma and hay-fever. What authors could speak with more authority?

The second large division deals with the pharynx and nasopharynx. One particularly interesting chapter deals with tonsilloscopy. Here Dr. French tells of his researches in transilluminating the tonsils. He describes lucidly the extensions of the faucial tonsil down and onto the tongue. A diagrammatic illustration on page 252 represents clearly the arbitrary divisions of what he calls the infratonsillar lymphoid tissue, into the pharyngeal branch, the lingual branch of the lingual tonsil, and the lingual apron. He shows how these infra-tonsillar tissues can carry cryptic disease which may continue to trouble after the removal of the faucial tonsil, and he advocates the removal of this pharyngeal branch as a regular part of the routine tonsil operation. He has also developed a sort of curette or scraper with which to clean the crypts of the lingual tonsil and its branch and apron. He has found as others have, the limitations of the tonsillectome or snare in removing the faucial tonsil with its pharyngeal branch in one mass, and he now advocates that the whole process be done by dull dissection without the use of the snare. This procedure permits the removal of the lower part of the tonsil from its capsular bed and reduces the amount of hemorrhage. I might add that this is an interesting harking back to the methods of the earliest operators who used finger dissection so successfully. Later, the use of sharper instruments was attended with more bleeding and the operation fell into comparative ill-repute for a good many years. Then the tonsillotome was invented and we are working back to the complete eradication of the tonsil in selected cases, in which Dr. French takes this advanced position.

Another interesting chapter is by Prof. Fetterolf, on suppurative complications of the lung following tonsillectomy. It will be remembered that he was awarded the deRoaldes prize for meritorious research as a result of his investigations in this field. He points out that figures as to the frequency of post-operative complications are unsatisfactory, for the observations have been made under varying conditions and from widely differing viewpoints. In the past four years approximately 950 cases of lung abscess have been reported by observers in this and other countries. Almost fifty per cent. of these have followed tonsillectomy. To demonstrate how widely authorities differ, he shows that Moore estimates the incidence of post-tonsillectomic lung abscesses as about 1 in 2500; Keiper found it in 1 out of 781; Hedblom reporting from the Mayo Clinic found a total of 692 cases of lung abscesses, of which only 21 per cent. followed operative procedures. Of these post-operative abscesses, 31 per cent. followed tonsillectomy, 26 per cent. followed laparotomy, and 9.5 per cent. followed tooth extraction.

The third part dwells on the ear. Here Prof. Shambaugh is the leading authority who discusses the anatomy. The functional testing is discussed by Sonnenschein who has done so much research work on tuning forks in functional testing of the hearing. The author, Prof. Coates, gives an interesting chapter on the care of the deaf and the deafened, and their rehabilitation through lip-reading and in the leagues for the hard of hearing; and Prof. D. Harold Walker closes this phase by discussing the mechanical aids available for impaired hearing. Otosclerosis is carefully reviewed by Prof. Harry P. Cahill. The blood clot operation in simple mastoidectomy which Dr. Clarence J. Blake espoused, is discussed by perhaps its leading living exponent, Dr. Henry O. Reik of Baltimore. Middle ear surgery by Fenton of Portland, Oregon and mastoid surgery by Rae of New York are clearly written and well illustrated. In the succeeding thirty-eight pages, Dr. Eagleton of Newark, New Jersey a recognized leader, gives a valuable contribution in his detailed discussion of intracranial complications from aural suppuration, which Dr. Day of Pittsburgh then discusses, in its surgical aspects. The tests of the vestibular apparatus are elaborated by E. R. Lewis of Los Angeles, giving the up-to-date methods and diagnostic findings in this complicated field.

The fourth part considers the larynx; the fifth takes up endoscopy; and the sixth deals with diseases of the esophagus and tracheo-bronchial tree. As the reader would desire, Dr. Jackson writes much of this himself, assisted by his son who fittingly is entering this difficult field of surgery. Other experts have, however, been called upon. Irwin Moore of London tells about neuroses of the larynx; Lemaitre and Maduro of Paris report the results of war gas burns; Lyman Richards of Boston, E. J. Moure of Bordeaux, A. Logan Turner of Edinburgh, St. Clair Thompson of London, H. P. Mosher of Boston, R. C. Lynch of New Orleans, Lukens, Tucker and Clerf of Philadelphia, are among the galaxy of those who have labored in our behalf. This fourth part alone, with its careful review of the anatomy, diseases and operative treatment of the larynx, bronchi and esophagus, with its culling of the best from each author, would make this book a valuable addition to one's library.

When the reader has secured and read this book, he will join with the reviewer in hoping that the authors will consent to put out another edition after a few years have elapsed, in which the most up-to-date opinions will be again granted us, and in a yet more elaborate manner, thus developing a two or three volume treatise which can serve as a much needed authoritative reference book for those that follow our specialty.

The Medical Department of the United States Army in the World War. Volume III. Finance and Supply. Prepared under the direction of Maj. Gen. M. W. Ireland, the Surgeon General. By Col. Edwin P. Wolf, M. C. U. S. Government Printing Office: Washington: 1928. Pp. 935.

The third volume of the World War series on Finance and Supply, though not as long as some of the other volumes, must always remain one of the most important, from the nature of the great problems so well written of in this book.

In the preface we are told that "This is the first time an attempt has been made to consider fully the history of Medical Department supplies, it is appropriate that due consideration be given to the prewar history of supplies." One of the most interesting parts of the volume is this history of the evolution of the Medical Department supply system,

which is traced down from the Revolutionary period to the end of the World War.

The volume is divided into ten sections dealing with the different problems of supply at home and abroad and the cost thereof.

Many illustrations add interest to the text, particularly to be mentioned are the pictures of the different types of ambulances found to be most practical, the medical carts, and the "snow-shoe litters" which proved so valuable for trench work.

It is of interest to note that the average annual expenditure for medical supplies for the Army for the three years just before the Spanish-American War, was well under $59,000. This figure seems impossible, when we note the great sum necessary to carry on a year's work in the World War, for medical supplies alone. Apart from the enormous increase in troops, we must remember that appropriations were pitiably inadequate for peace times and a small army, until the Dodge Commission made their report and recommendations after the war with Spain.

Perhaps in no volume of the series has such a mass of valuable statistics been brought together as in the present one. The details of the countless activities of the medical officers in charge of this work, as put forth in Colonel Wolf's contribution to the series, must be gleaned from a careful reading of the book.

Principles and Practice of Minor Surgery. By Edward M. Foote, M.D. and Edward M. Livingston, M.D. D. Appleton and Company, 1929. Sixth Edition.

Foote's work on Minor Surgery has passed through five editions and is a well-known textbook. In the preparation of this sixth edition, Dr. Foote has associated with him Dr. Edward Meakin Livingston. The book is divided into three parts. The first two parts on Minor Surgical Technic and Principles of Diagnosis and Treatment (excepting the chapter on Bandaging) have been written anew by Livingston. The two parts comprise 256 pages. The third part on Minor Surgery (Regional) has been thoroughly revised by Foote, after a careful search of the literature of the last ten years, and an extensive correspondence with many of the industrial surgeons of the country.

The chapters on Technic deal with equipment, methods of suturing and tying knots, asepsis, bandaging and anesthesia (chiefly local and regional). The final chapter in this part deals with special operations, such as nerve and tendon repair, skin grafting, blood transfusion, etc. In tendon repair the necessity of suturing the sheath is open to question. In the aftercare of sutured tendons the principle of instituting *passive* motion after seven to ten days and delaying *active* motion may be criticized.

The second part of the book on Principles of Diagnosis and Treatment includes chapters on the clinical consideration of wounds, inflammations, special infections, neoplasms, congenital defects, and a general consideration of fractures. The chapter on neoplasms is only a general consideration of the subject. In it "an attempt has been made to clarify the subject of terminology; to state the full clinical significance of the terms which are employed; to point out that, at the present time, the tumors themselves must be studied individually, and with reference to their site of growth; to refer to the index for a regional study of the common superficial neoplasms and to the differential diagnosis between various tumors, and other conditions from which they must be distinguished; to describe the chief clinical and pathological evidences of malignancy; to state the grounds for the statement that cancer is curable; and to evaluate the position of the minor surgeon in cancer education." "On account of the necessity for wide observation and extended clinical experience in dealing judiciously with new growths, the unsatisfactory present state of knowledge concerning their causes and the rapid changes which occur in this field, it is a wise rule to refer all doubtful cases to a specialized cancer center or clinic, or to have them promptly seen by an expert. The types of tumors which the minor surgeon is justified in treating are relatively few". "With any neoplasms avoid incomplete and meddlesome surgery".

The third part of the book deals with the practice of Minor Surgery. The subject is presented regionally. In each region the differential diagnosis and treatment of injuries, inflammations, tumors and deformities is considered. Attention to details is as important in minor surgery as in major surgery. Careless and unintelligent treatment may lead to serious consequences. The author gives the essential details with admirable clearness.

Under treatment for Colles's fracture it is stated that after reduction the hand of the patient is "put in whatever position of flexion, extension, abduction, or adduction best keeps the reduced radial fragment in correct position." Since the reduced radial fragment in most cases of this fracture is best maintained in the flexed position, it is unfortunate that the only two illustrations under this heading show the extended position with the legend— "This position of the hand is desirable in *many* cases to prevent recurrence of deformity."

In a work which is remarkable for detailed and practical guidance, it is disappointing to note the author dismiss the treatment of fractures of the carpus with the statement, "The treatment is the same as that of a severe sprain. If a portion of a bone is so displaced as to interfere with motion, it should be removed."

It is, of course, difficult to draw the line between major and minor surgery. Operative procedures for diffuse tuberculous tenosynovitis of the hand and wrist, for Depuytren's Contracture, for webbed fingers and for reconstruction of a thumb are very briefly presented in this work. They might be more properly dealt with at length in a treatise on major surgery. Certainly the open reduction of fractures of the humerus and radius and ulna should not be classed as minor surgery. An open method of treatment (Thomson-Welch) is described on pages 588 and 596. A steel lever rod which has been used to accomplish reposition of the bone ends is left in place while a plaster-of-paris splint is applied. That portion of the rod which projects beyond the window in the plaster is then sawed off. The remaining portion is withdrawn in a week or ten days. The reviewer deems this dangerous teaching in a work on minor surgery.

This work is a thoughtful, careful exposition of two experienced observers accustomed to teaching.

It is methodical. It is clearly expressed. It is thoroughly practical. Its 420 illustrations, chiefly from original drawings and photographs, admirably supplement the text. It has a good index. It is an excellent book for the general practitioner, for the surgical interne, and for the library of an out-patient hospital staff.

The Medical Department of the United States Army in the World War. Volume X. Neuropsychiatry. In the United States, by Col. Pearce Bailey, M.C., Lieut. Col. Frankwood E. Williams, M.C., Sergt. Paul O. Komora, M.D. In the American Expeditionary Forces, by Col. Thomas W. Salmon, M.C., Sergt. Norman Fenton, M.D. Prepared under the Direction of Maj. Gen. M. W. Ireland, the Surgeon General. Washington: U. S. Government Printing Office: 1929.

The tenth volume of the World War series is, as usual in these publications, divided into two sections, concerning the problems of Neuropsychiatry in the United States, and in the Expeditionary Forces.

The great importance of this subject in relation to the World War becomes apparent to even the casual reader in the first pages of the Introduction.

The psychiatrist was at first looked upon somewhat coldly by his brethren of the Medical Corps, both at home and abroad, and the importance of his work was at first minimized. Gradually the vital necessity of men with knowledge of this specialty was borne in on the general Medical Staff.

Of the thousands of men pouring into the training camps at home, from all walks of life many were totally unfit for combat troops. A few were malingerers, a few were actually afraid to the extent of cowardice, but many of the mentally unfit were so through no fault of their own. No one but the trained neuropsychologist had the knowledge to differentiate these groups, classify them, reject numbers as totally unfitted, and recommend duty proper for the others.

Abroad the problem of the so-called war neuroses, shell shock, and hysteria had to be met by the same men, and suitable hospitals made ready for their study and care. Gradually the immense importance of the problem began to be appreciated, and those who were doing this work received the respect and honor to which they were so well entitled. Probably no more difficult work, requiring infinite patience, and knowledge, was done in the War. At first, it is not strange to say, the group being considered, received more help and encouragement from the Line Officers, than they did from their fellow doctors. To the Regimental Commander, who brought his problem of discontented men, and "queer actors" for solution to the "neuropaths" it meant much to find that a searching analysis from these specially trained men often found the trouble at once, and a change of duty rendered a previously incompetent man eager and willing in his new environment.

In regard to the greater and lesser psychoses so common, the following quotation from the introduction is pertinent:

"The peculiar kind of stress which military life imposes upon psychopathic individuals is among the reasons adduced for the excessive prevalence of insanity among soldiers." Men who were doing their routine stint at home with narrow limitations of mental safety went under, when faced with the new life, and rigid discipline of the Army, entirely apart from the exigencies of actual combat. To find these individuals before it was too late, discharge some, and help others to work which was more congenial, whenever possible, was an important part of the psychiatrist's work.

"The attitude that the psychiatrist encountered at the various training camps in this country is well described in the description of the types of nervous disease encountered and 'The Methods of Approach.'

"One hardly expected to be received with enthusiasm when one arrived at a camp to do neuropsychiatric work. There appeared to be on the contrary, with very few exceptions, a lack of interest or an indifference, or a manifest skepticism, not infrequently there was a passive, or even an active antagonism to any examination of this sort. Strangely enough the medical officers were the chief passive obstacles, and in the beginning very little assistance or co-öperation could be obtained from them . . . they had to be made to appreciate the importance of neuropsychiatric examinations. In order to accomplish this one frequently had to resort to tact, persuasion, or even strategy."

"In dealing with this situation of passive resistance, it was desirable in the beginning to report as unfit for military service only men with obvious nervous or mental disturbances, in whom one could show the disorder in its early phases, and point out how the disease influenced the soldiers' conduct and efficiency."

"For example, the painstaking demonstration of early cases of tabes, of disseminated sclerosis, of paresis, of dementia precox or of manic-depressive psychosis, which had been unrecognized and unsuspected, went a great way in rousing the interest and even the enthusiasm of the medical officers. The greatest help to the neuropsychiatrist came however, from the line officer, and particularly the company commander. It may seem strange, but it is nevertheless true that the line officers appreciated the value of neuropsychiatric examinations much more readily than did the medical officers."

To turn for a moment to the experiences over-seas we quote from a report from the Psychiatric Department of Base Hospital No. 8: "Some idea of the magnitude of the problem of providing even temporary care for the insane of the American Expeditionary Forces is shown by the fact that more cases are admitted to the psychiatric department of Base Hospital No. 8 each month than in the psychopathic wards of Bellevue Hospital, which serves a city of more than 5,000,000 people."

Even with such statistics as these before us, it is impossible to form an adequate idea of the work so well done by this branch of the Medical Corps at home and abroad.

The reader will become aware of this, only as he goes through the pages of this fascinating volume of the World War Series.